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Report on Ulcerative Lymphangitis in the A. E. F.

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DURING the winter of 1917-18 and the summer of 1918 lymphangitis in its various forms became quite a serious problem among the horses and mules of the American Expeditionary Force in France. It resulted in the evacuation of a large number of animals from the front lines to the rear and in view of the ever increasing number of cases the Chief Veterinarian, A. E. F. considered it advisable that an investigation be begun. The writer was accordingly sent to Veterinary Hospital No. 6, Neufchateau, Vosges, France, in April 1918 for this purpose. The clinical work was conducted in a very efficient manner by Lt. A. C. Wight, V. C. (later Capt.) at that time and for several months thereafter. Later in the fall after several changes the writer was given this work, beside the laboratory work he had been conducting since succeeding Lt. Straus, Sanitary Corps, on this work in June.

Ulcerative lymphangitis, according to the writer's observations exceeded all other forms many times, occurring in 97.5 per cent of cases of lymphangitis. It has a decided tendency to run a protracted course, often incapacitating animals for weeks. Under the term ulcerative lymphangitis, there will be included in this report all cases which were shown by bacteriological examinations not to be epizootic lymphangitis. Thus there are included under that one term pathological processes which resemble one another clinically but which can be differentiated bacteriologically. It includes what the French term contagious ulcerative lymphangitis, the classical form of which is due to the Bacillus of Preisz-Nocard; also that form from which the only organism isolated by the writer was a streptococcus, which in most cases was a hemolytic streptococcus. In some cases the streptococci occurred with staphylococci or B. of Preisz-Nocard. A few cases yielded staphylococci alone. The investigations of the writer covered approximately 225 animals suffering from various forms of lymphangitis, a bacteriological record being kept on 165 of these animals. The organisms found occurred as follows:

	Per Cent	Cases
Streptococci alone in	72.62	117
B. Preisz-Nocard alone in	6.06	10
Streptococci with staphylococci in	6.06	10
Staphylococci alone in	4.24	7
Streptococci with B. Preisz-Nocard in	2.42	4
Staphylococci with B. Preisz-Nocard in	0.60	1
Cryptococcus of Rivolta alone in	2.42	4
No Cultures obtained from	7.21	12

Of the 72.62 per cent of cases in which streptococci were found alone, 84 per cent were hemolytic. ,

Gross Pathology of Ulcerative Lymphangitis

Most commonly the lesion that first occurred in the early stage was a swelling, pea-sized or sometimes larger, which was usually found on the limbs, particularly on the hind limbs between the fetlock and hock joints inclusively. The swelling and tenseness of the skin over such a small lesion causes the hair to stand upright, which assists one in first noticing the disease. As a rule this is overlooked due to

the heavy hair covering and mud or filth; such a case is not reported until a line of sanguinous pus is seen down the limb, which results from the swelling having suppurated and ruptured. If such a small swelling be incised before or just after it has ruptured, it will be found to be composed of dark, blue-black necrotic tissue of rather firm consistency with a possible centrally located, suppurated focus, depending on the extent of development. A lesion of this kind develops very rapidly—apparently within twelve to eighteen hours and is commonly referred to as a "blow-out." If it ruptures the discharge is of a sero-purulent, sanguinous character. If the suppuration of the resulting ulcer is allowed to continue for two or three days, the bulk of the necrotic tissue will have sloughed away and the underlying surrounding subcutaneous tissue will have become involved and the lesion tends to progress. Two or more swellings may occur in close proximity to one another in which case it is not uncommon for the affected areas to become confluent, particularly if neglected, resulting in a large open lesion. In many cases these small lesions occurred in short chain formations having some of the characteristics of epizootic lymphangitis.

At times the initial lesion is apparently not a small, firm swelling, but develops as a fluctuating abscess the size of a pigeon's egg, or even larger. The contined pus is of a dirty gray color, sometimes streaked with blood or creamy. Then again, a lesion may seem to at once involve a large area of several inches in diameter, manifesting itelf as a warm, soft, very painful swelling. Such lesions, as a rule, develop near the tarsal or carpal joint. However, such an involvement has more than one suppurating focus, indicating that originally there apparently were several focal involvements. This idea is upheld by the fact that the swelling between the points of rupture will, under treatment, disappear and the ulcerous areas begin to granulate and heal, indicating that the intervening subcutaneous tissue was not primarily involved. Cases of this sort which are neglected will develop into large ulcerating, discharging lesions with little tendency toward spontaneous healing.

Lameness is not uncommon and is often the first indication of this form of lymphangitis. A rise in temperature may also be observed but this varies and is seldom alarmingly high. The tendency of this disease toward recurrence is characteristic. In the writer's opinion, it is questionable whether all recurrent cases are actually relapses, or whether there exists a reinfection. It is generally spoken of as being a relapse, but since weeks, and even months, sometimes elapse before a new lesion develops, it appears that many cases are reinfections and not relapses, in the strict sense of the word. This idea is strengthened by the fact that later lesions often occur on a different limb from that primarily involved suggesting more a reinfection than a relapse.

There follows a tabulated record of the location of the lesions on sixty-three animals:

Left Hind Leg:	A—Hock:				
	Internal aspect	3			
	External aspect	8			
	Anterior aspect	1	12		
	B—Cannon:				
	Internal aspect	2			
	External aspect	6			
	Anterior aspect	3	11		
	C—Fetlock:				
	Internal aspect	2			
	External aspect	2			
	Anterior aspect	2			
	Not recorded	3	9	32	lesions on left hind leg.
Right Hind Leg:	A—Hock:				
	Internal aspect	2			
	External aspect	6			
	Posterior aspect	1	9		
	B—Cannon:				
	Internal aspect	5			
	External aspect	9			
	Anterior aspect	2			
	Posterior aspect	1	17		

	C—Fetlock:			
	Internal aspect 1			
	Not recorded 1	2	28	lesions on right hind leg.
			60	lesions on both hind legs.
Left Front Leg:	A—Knee:			
	Anterior aspect 3			
	B—Cannon:			
	Not reported 1			
	C—Fetlock:			
	Anterior aspect 1	5		lesions on left front leg.
Right Front Leg:	A—Knee:			
	Anterior aspect 3			
	B—Cannon 0			
	C—Fetlock:			
	Not reported 1	4		lesions on right front leg.
		9		lesions on both front legs.
Left Stifle, internal aspect 1				
Right Stifle, internal aspect 1				
Right Stifle, anterior aspect 2				
Left side of neck 1		5		lesions on other parts of body.
			74	Total lesions.

From this table it is seen that 60 of the total 74 lesions occurred on the hind legs, or 81.08 per cent; only 12.16 per cent of the lesions being on the front limbs, and 6.75 per cent on other parts of the body. The table also shows that the majority of the lesions occurred on the more exposed parts of the body and limbs—those subject to more injury.

Summary of Gross Pathology

Two predominating types of lesions were encountered, viz.: the small, rapidly forming lesion, which in the A. E. F. vernacular was termed a "blow-out," and, secondly, the larger lesion, which attained the size of a pigeon's egg, or larger, developed somewhat more slowly, and was the more painful of the two. In many instances this larger type of lesion was the initial appearance of the disease, while in other cases the animal had at some previous time developed the first described, smaller lesion. Whether or not the larger lesion is a secondary condition following the development of the smaller one, or whether they each constitute a distinct form of the same disease, it was impossible to definitely determine under the existing circumstances, where confusion in the records of the clinical work during the latter part of the summer, interfered.

From the record indicating the location of the lesions on 63 animals it is seen that 81.08 per cent occurred on the hind limbs. Another noteworthy factor is that the greater majority of lesions occurred on the more exposed parts of the body and limbs —that is to say, those subject to more frequent mechanical injury.

The mode of infection is undoubtedly through breaks in the continuity of the skin, through hair follicles or sebaceous gland ducts. The fact that the greater majority of animals suffered from mange and also that the lesions developed on the more exposed parts of the body, particularly on the limbs, is strong evidence that the infection occurred by means of organisms in mud and filth gaining entrance through abrasions of the skin.

Eliminating the Possibility of Glanders

Since many cases of lymphangitis closely resemble the skin form of glanders, all animals were given the intrapalpebral mallein test before being sent to the lymphangitis stables. Upon their receipt the writer withdrew blood from the jugular vein, which was sent to U. S. Laboratory No. 1, for complement-fixation test. Out of 159 animals which were said to have been negative to the I. P. test, the complement-fixation reaction showed 105 negative, 30 ±, 15+, 2++, 1+++, 6++++. Animals which gave three plus or four plus complement-fixation reactions were destroyed as glanderous. The others were isolated and retested in two weeks. All lymphangitis cases were tested with the I. P. test every two weeks and those which gave positive reactions were destroyed and the suspicious ones isolated.

Method of Obtaining Bacteriological Specimens

In cases where the characteristic lesions had not ruptured, the hair was cut short or shaved off and the area thoroughly cleansed with a 5 per cent liquor cresolis compositus solution. A scalpel, previously

sterilized by boiling in water for 15 to 30 minutes, was used to make an incision into the lesion. Through the gaping wound a sterile cotton swab was introduced and the material for examination obtained from the depths of the lesion.

In case the lesion had ruptured, leaving an ulcer, the surface excretion was removed by washing with 5 per cent liquor cresolis compositus solution and the sterile cotton swab pushed into the deepest portion of the ulcer.

In all cases the main object was to avoid obtaining material from the surface which naturally contained organisms which had no bearing on the case, it being believed that the causative organism would be likely to occur in an uncontaminated condition in the depths.

Bacteriological Examination of Specimens

Direct smears of the discharge on glass slides and stained by any of the common methods did not give satisfactory results except in the case epizootic lymphangitis. Consequently a culture medium was sought which was favorable for the growth of the majority of pathogenic bacteria. A number of different media were tried including anaerobic cultivation, but whole blood agar gave the most satisfactory results. Plates were streaked with the swabs and incubated at 37 degrees C. for 24 to 48 hours. Both streptococci and B. Preisz-Nocard grew very well although the latter was not quite as prolific as the former and usually required 35 to 45 hours to develop distinct and characteristic colonies.

The streptococci were easily isolated and rapidly developed in the greater majority of cases (84 per cent) a clear zone of hemolysis around the colony. They grew well in dextrose bouillon where they developed long chains and acid. Acid was also produced in a number of other carbohydrate media. The streptococci isolated were Gram-positive throughout, but occasionally one was encountered where some of the individual cocci in the chain did not retain the stain as well as its neighbors. Some of the many strains were examined for their pathogenicity and when injected subcutaneously into rabbits and guinea pigs produced large abscesses at the site of inoculation and in some cases the neighboring lymph glands developed a purulent inflammation.

Bacillus of Preisz-Nocard was also easily detected on whole blood agar plates where it produced a clear zone of hemolysis surrounding the colony. The growth was dry, opaque and broke into small fragments when disturbed with the platinum wire. The colonies were small and developed a papillated center. Although the colonies were visible at the end of 24 hours' incubation the writer preferred to allow 36 to 48 hours to elapse before making the final reading of the plate since the more characteristic features of the colony developed during the second 24 hours cultivation; the hemolysis was progressive and the papillate center would be more easily seen at the end of 36 to 48 hours. All colonies suspected of being B. Preisz-Nocard were cultivated in dextrose bouillon where this organism produced a granular sediment, leaving the supernatant fluid clear. In some cases a dry surface pellicle was formed. The organism is pleomorphic, shows granules, and is Gram-positive. Six of the strains of B. Preisz-Nocard isolated produced acid in dextrose, levulose, maltose and mannite, particularly in the first two. Dextrin and saccharose were variable, especially the latter. Lactose and galactose gave no reactions whatever. No gas was produced from any of these carbohydrates. This organism is also pathogenic for rabbits and guinea pigs.

The staphylococci isolated were present in pure culture in only seven cases. The type encountered was Staphylococcus albus.

Summary of Bacteriological Work

By using whole blood agar plates as a culture medium no difficulty was encountered in determining what organisms were present in the lesions. Transfer of colonies from the blood agar to dextrose bouillon was found advisable in some cases but usually a definite diagnosis could be made without this procedure. Staining direct smears from the same swab by Gram's method after the plates were inoculated, together with the culturing methods given, proved to be a satisfactory means of making bacteriological diagnoses in 92.76 per cent of the cases. As mentioned before no growth was obtained in 7.21 per cent (12 animals). If opportunity had offered

itself it is very probable that subsequent culturing from these animals' lesions would have given definite results. But in many cases the horse was lost, due to the several changes that were made at the hospital.

Treatment of Ulcerative Lymphangitis

It was hoped that a vaccine made from the infecting organisms would prove more effective and if it had been possible to carry out experiments without the frequent interruptions which occurred, positive results could be mentioned. The results, however, were sufficiently encouraging that it is believed that if the animals could have been kept under closer observation and the termination of the cases noted, good results would have developed. Also the urgent need of animals at the front during these months, caused some early evacuations through which track of them was lost.

Consequently the most satisfactory results noted were those from surgical and medicinal treatment. From a consideration of the pathology and nature of infection of this disease, the writer came to the conclusion that the best results should be obtained from early radical treatment. With this idea in mind, the following surgical and chlorazene treatment was carried out. This was begun at the time the writer was placed in charge of the clinical work, about three weeks before the animals were condemned, so that mention can be made only of a few cases. The hair was removed from over the swelling, skin thoroughly cleansed and a bichlorid of mercury pack applied over the area and left there for three to five hours. The lesion was then incised with a sterile scalpel, scissors and curette, and cotton swabs saturated with one per cent chlorazene solution were used to remove all necrotic tissue and pus. The wound was then painted with tincture of iodin and packed with gauze saturated with one per cent chlorazene solution, the pack being kept in place by bandaging. This was kept moist with chlorazene for the next twelve to eighteen hours, when a new pack and bandage were applied. This treatment was continued until granulation had proceeded sufficiently to warrant leaving the pack off, and applying a boric acid dusting powder. The seven horses treated in this manner responded very satisfactorily. The acute cases healed quite readily, but those of longer standing required considerably more time.

Epizootic or Cryptococcic Lymphangitis

Since this type of lymphangitis is well described in standard books, only a limited amount of space will be devoted to it here. The number of cases encountered were very few indeed, only four coming under the writer's observation at Neufchateau out of a total of about 225 cases of all forms of lymphangitis. Their nature was at once suspected by the virulent character of the lesion, the ulcerating area occurring in chain formation and following a lymph channel with usually several to many ulcers on the same leg and discharging a dirty, creamy pus. Microscopic examination of this pus, without staining, revealed the Cryptococcus farciminosus (Rivolta), the causative agent. Since all animals so infected were ordered to be destroyed, no experimental work was carried out.

No cases of lymphangitis due to a sporothrix were encountered.

Discussion

The etiology of lymphangitis, aside from the cryptococcic form, is as the findings suggest, not a closed subject. Bacillus of Preisz-Nocard is understood to be the cause of ulcerative lymphangitis and the writer succeeded in finding and cultivating this organism in fifteen (15) cases out of 165, only ten in pure culture. From the greater majority of cases a streptococcus was cultivated—72.62 per cent in pure culture (from 117 horses), 6.06 per cent (ten horses) where the streptococcus occurred with staphylococcus. Of those cases in which streptococci were found alone, 84 per cent were hemolytic. Attempts were made to reproduce lymphangitis in horses by injecting intradermally and in other cases subcutaneously in the legs a bouillon culture of hemolytic streptococci isolated from other cases; but during the comparatively short period during which the animals could be kept under observation, typical lesions did not develop although a painful swelling at the site of injection did occur in some of these animals. The period of incubation is not known in any of the forms. Consequently, it is not impossible that some of these experimental

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Prolapsus of the Vagina

By J. V. LACROIX, D. V. S., Evanston, Ill.

PROTRUSION of the vaginal walls beyond the vulvar lips is a condition observed in pregnant cows, ordinarily before parturition; and in the mare and sow, usually after parturition, in cases of dystocia where injury to the vaginal mucosa occurs. Vaginal prolapsus may occur in mares and cows because of great intra-abdominal pressure or injury or inflammation of the cervix of the uterus.

This condition affecting cows is described as "antepartum prolapsus of the vagina," and writers commonly refer to it as a disease of the pregnant cow. As a matter of fact, prolapsus of the vagina occurs most frequently and is most troublesome in fat cows and heifers whether pregnant or not. In show cattle of the Hereford breed, this condition is the cause of great annoyance and considerable loss to the owners. It may be observed in these animals more frequently in the non-pregnant than in the pregnant.

Cause

Various conditions are to be looked upon as being either the direct cause of prolapsus of the vagina or provoking it indirectly.

In mares we have not observed vaginal prolapsus except as the result of injuries done these parts in cases of dystocia. Protrusion of the vaginal wall may be noted in mares that suffer from acute indigestion and flatulence, but this seldom if ever results in serious vaginal disturbance, if the subjects recover without great delay and injury to the parts is not inflicted in tumbling about in stalls.

Sows infrequently experience prolapsus of the vagina. Much damage is done the genitalia in many instances by crude manipulations of unskilled operators who attempt delivery of pigs in cases of dystocia, but this is not usually followed by prolapsus of the vagina. Great swelling and infectious inflammation of the external genitals may be observed in many of these cases, but there occurs little more than eversion of the vulva and slight protrusion of mucosa, even in fatal cases.

On the other hand, cows are more susceptible to this affection, and it occurs in fat animals where apparently it is due to intra-abdominal pressure, a lax condition of the perineum and probably a predisposition to the condition because of conformation. Where the abdominal viscera are so bulky that much pressure is directed toward the pelvis, lying in sloping stalls, violent exertion or tiresome railway journeys, tend to cause prolapsus of the vagina.

It may also occur in heifers or cows within a few hours after having been bred, due to injury done the cervix of the uterus. In such cases prolapsus of the vagina is a sequel; violent straining which may persist for several hours if unchecked, is succeeded by vaginal prolapse.

Inactivity and loose areolar tissue admixed with much fat in the recto-vaginal region certainly predispose to vaginal eversion, but prolapsus of the vagina is also seen in cows that are thin and more or less weakened or even emaciated. It may occur in such animals when they are kept out daily, and in some cases the subjects are young.

Symptoms

Uncomplicated prolapse of the vagina is generally recognized by the presence of a protruding tumor-like mass that is covered with mucosa, situated on one side of the vulva. The mass may involve more or less of the dorsal portion of the vulva, and in extreme cases both sides as well as the dorsum may be protruding; then, an arch-like mass of tissue bulges outward, and its branches recede toward the inferior or ventral vulvar commissure.

When the hand is inserted between the vulvar lips and pushed forward, the cervix of the uterus is readily located if it is not protruded so as to be in view. The meatus urinaris may be found in position, and if the bladder contains a few quarts of urine, its position is easily determined. If necessary when the bladder is empty, it may be partially filled with normal saline solution or sterile water to facilitate determining its position. This is essential when amputation of necrotic portions of vaginal wall is necessary, if retroversion of the bladder exists.

Prolapsus of the vagina in fat cows during fly time is a condition which demands prompt attention, else the protruding mucosa, which soon becomes soiled with fecal matter that desiccates in situ, as well as suffering irritation caused by switching of the tail, becomes so badly injured that reposition and retention in position of the prolapsed parts is difficult or impracticable. In some cases the irritation and infection of the parts incite violent straining and the straining promotes edema so that the protruding mass attains enormous dimensions. As soon as the protruding mass is of considerable size, it is impossible to retain it in position despite the utmost care given to cleansing and soothing the inflamed tissues. In such cases attempts at retaining the infected tissues in position by means of labial sutures or similar methods result in failure; the straining persists and necrosis of the infected tissues progresses and a fetid odor is present. Discharge of a moderate quantity of mucopurulent material attracts flies in the summer time, and unless animals are protected against these insects, they cause great annoyance.

In thin cows that suffer from uncomplicated prolapsus of portions of the vaginal wall, no marked disturbance is occasioned by the displaced parts in some cases. Such animals may not show evidence of inconvenience; no expulsive efforts are noticeable, and little if any interference with the usual rate of health is evident for several days or a week. If this occurs just before parturition time, the calf may be delivered and the prolapsus recover spontaneously. In other instances, however, marked disturbance results from the affection, and it may even be necessary to amputate the prolapsed tissues.

Prognosis and Treatment

The handling of prolapsus of the vagina in all cases where delivery of the fetus is not of first consideration, begins with thorough cleansing of the exposed parts. Such cleansing ought to be accomplished with the least possible injury to the tissues and the use of antiseptics or other agents that irritate must be avoided. When in the judgment of the operator replacement of the prolapsed parts is in order, after having thoroughly cleansed the soiled vaginal tissues, they are anointed with a bland or somewhat anesthetic preparation such as carbolized vaseline or carbolized oil (1-100) and the prolapsed tissues are gently replaced with the hands. Straining is prevented by elevating the hind parts of the cow, administering chloral hydrate, or if the cow is standing, by holding a rough, short pole over the lumbar region. Recurrence is prevented by inserting sutures of linen tape across the vulvar lips, attaching them on either side. Daily or more frequent douching of the vagina with nonirritating and mildly antiseptic solutions may be required to prevent suppuration.

If prolapsus occurs suddenly near the expiration of the period of gestation, there are cases where one is justified in dilating the cervix of the uterus and delivering the fetus. Sometimes when this is not done, it is necessary to effect delivery when labor begins as the subjects are unable to expel the fetus because of a general weakness.

In animals that have been injured during parturition, more or less infection of the vulva is present, and it is necessary to apply hot antiseptic compresses to the parts or to employ other measures tending to inhibit the progress of the infectious inflammation. General surgical principles apply in such cases, but caution is necessary so that the treatment instituted may not provoke irritation of the parts.

Where fat show cows are affected, it is decidedly best to give attention to the condition during the incipient stage, employing soothing, mildly antiseptic preparations locally. Furthermore, it is necessary to retain the parts in position by means of suitable appliances or prolapsus will recur, eventually rendering the subjects worthless for anything but slaughter.

In these animals, probably the most satisfactory appliance employed to retain prolapsed vaginal parts in place, is the small sized bull rings such as are put in bulls' noses. Two such rings so placed that the space between the labial commissures of the vulva are equally divided may be worn for months or even years without causing trouble if ordinary care is given to keep the parts clean when this is necessary.

Complicated cases referred to are those occurring in fat cows, where owing to aggravation of the condition, retroversion of the bladder takes place and large ne-

crotic masses of hypertrophic vaginal tissue remain exposed at all times—cases where amputation is necessary. Discussion of these cases does not come within the domain of this article.

When amputation of a prolapsed fold of vaginal wall is necessary, the parts are preferably "tied off" by means of the saddlers' stitch and amputated with a scalpel or scissors at a point distal to the line of suture. This is done after having completed all preparations such as restraint, anesthesia and cleansing of the field of operation. After-care consists in irrigation as suggested following reposition and if straining is violent, sutures may be necessary to hold the parts in position. If amputation is thought necessary, it must not be delayed as this lessens chances for a satisfactory outcome.

Preliminary Study in the Bacteriology of Jellied Meat Products

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JELLIED meats have given the authorities responsible for food control more concern than any other meat product. A number of cases of so-called ptomaine poisoning have been attributed to the ingestion of spoiled jellied meat. From the 26th to the 29th of March, 1917, thirty-four cases of suspected meat poisoning were reported in Toronto. All of these cases occurred after eating jellied tongue prepared in one establishment, and in two instances the meat was purchased from the same retail store. There was a striking similarity in the history and symptoms observed in each case. The following may be taken as a typical example: Within six hours after eating jellied tongue, the principal, five teachers and fourteen pupils of a boarding school developed acute abdominal pains, and vomiting. There was no evidence of other gastro-intestinal disturbance. Although some of those affected were dangerously ill, there were no fatalities. The members of the households in which the cases occurred who had eaten ham or other meat instead of jellied tongue did not become ill. No systematic bacteriological examination of the suspected meat was made at this time; but it seems probable in view of the history of the cases that the meat was responsible for the outbreak.

The preparation and handling of jellied meats is also an economic problem. The loss from spoilage is estimated to be about four per cent of the total output and this waste in a food product which costs the consumer fifty or sixty cents a pound is of some economic importance. Under the present method of packing, the product must be marketed soon after it is packed, since nearly all jellied meats will show signs of decomposition when kept in a cooler or household refrigerator for longer than ten days.

This work was primarily an attempt to find a remedy for this undue waste by a study of the sources of contamination; but it follows that any method of handling that would eliminate this loss would also give the consumer a safer product.

Preparation of Jellied Meats

Gelatine is used in jellied meats to fill in the spaces between the pieces of meat and to give the product a good appearance. It is also used in certain kinds of canned goods to assist in jellying. Formerly commercial gelatine, which is manufactured from scraps of hides, horns, and waste material from abattoirs and butcher stores was used in the preparation of these foods. Some of this material was often decayed before being assembled for processing; but the action of the lime solution with which this material is treated in the course of its manufacture largely removes the poisons of bacterial action. The gelatine was not usually made in the packing plant but was bought from manufacturers who made a specialty of this business.

The Meat Inspection Division, Department of Agriculture, has recently forbidden the use of ordinary commercial gelatine and all gelatine now entering into food products must be made under gov-

ernment supervision in the establishment in which it is to be used.

The jelly now used is manufactured from hogs' feet and skin. These are placed in large kettles and boiled until the material has jellied. It is then poured into shapes or pails in which it is stored until a batch of jellied meats is being prepared. No special precaution is taken to avoid contamination.

In putting up jellied products, the meat is packed by hand into oblong tin shapes, and then the melted gelatine is poured in until the container is nearly full. When the gelatine has solidified, a thin board is placed on the surface, and this is the only protection provided against contamination.

Sources of Meat Poisoning

From the standpoint of meat poisoning, these products are more dangerous than either fresh meat or canned food. The danger of fresh meat is fairly well controlled by inspection and cooking, and the processing of canned goods is a good safeguard. Jellied meats, however, are open to contamination during their preparation and handling until they reach the consumer, and are not cooked again before eating.

Meat poisoning may be the result of one or more of the following conditions:

(1) The organism of such animal diseases as hemorrhagic septicemia, blackleg, malignant edema, gas gangrene, anthrax, and suppurative and septic conditions that produce changes in the living tissue in which they are growing that render the flesh dangerous for human beings.

(2) Meat may become contaminated with organisms of intestinal origin such as B. enteritidis, B. paratyphosus, and the so-called hog cholera bacillus, which produce heat-resistant poisons; and if the contaminated flesh is not thoroughly cooked the consumer may not only become poisoned but also infected.

(3) The flesh from healthy animals may become contaminated during the course of its preparation with organisms that are capable of bringing about alteration in the tissue which renders it toxic. Among the organisms incriminated are B. proteus vulgaris, B. subtilis, and B. coli. Meat may also become contaminated with B. botulinus which causes a true intoxication by the production of toxin outside the body. If it be true that B. enteritidis, B. typhosus, B. botulinus, etc., are frequently present in the intestines of many animals, it may be reasonably assumed that some of them are ubiquitous in places where animals are slaughtered and prepared for food. The protein-splitting organism of the third group is certainly nearly always present. In view of this it is difficult to understand why meat poisoning as the result of ingestion of cold meat products is not of greater frequency.

Present Investigation

The present work was mainly directed to determine the extent of contamination and the chief sources of contamination. Although particular attention was given to the bacterial content of containers, gelatine, and meat at the time of packing, we were always on the lookout for the common food-poisoning organisms.

Bacterial Content of Containers

The tins in which jellied meats are sold are not sterilized before filling. In some establishments new containers are used for each batch, but in other plants they are returned by the retailer for refilling.

When these tins were ready for use, the bacterial content was estimated by rinsing them with sterile water, and placing a cubic centimetre of this wash water on nutrient agar and gelatine. Most of the containers were, of course found to be heavily laden with bacteria and moulds. In order to show the necessity for sterilization, the tins were then steamed, and the decrease in bacterial content determined. This was done merely to show the packer one source of contamination and the means of controlling it. No attempt was made to identify all the organisms present, but in a few of the cans returned for refilling B. coli were present, indicating, though the possibility of contamination from animal sources could not be excluded, that the containers might have been used for purposes other than those for which they were intended.

It is difficult to interpret the importance of the presence of B. coli in meat products because of the wide distribution in abattoirs; but it seems reasonable to suggest that their presence in some instances at least be taken as an indication of the presence of the more harmful paratyphoid-enteritidis group.

Bacterial Content of Gelatines

Many quantitative bacterial tests have shown that the gelatine is frequently heavily contaminated. A bacterial content as high as 12,000 per c. c. was found in some samples when the jelly was being poured into the containers. It is clear that the gelatine is not always heated to a temperature sufficiently high to kill the organisms when it is being melted for pouring. This is probably the principal source of contamination of jellied meats; and the temperature at which they are held (40° F.) is not low enough to retard the growth of many of the organisms planted with the contaminated gelatine.

We did not attempt to determine the nature of the organisms present in each sample; for it is obvious that almost any organism may find its way into gelatine in the course of its preparation and storage. In the observations made B. proteus B. subtilis, and in a few cases B. coli, were present.

Some authorities claim that gelatine is not of sufficient chemical complexity for the production of high order cleavage products, i. e., although suitable bacteria may be present in the gelatine, poisonous products, (ptomaines, etc.), can not be formed in the material in the natural process of protein disintegration. However, one cannot question the fact that gelatine is a fair medium for the growth of numerous microörganisms; and if gelatine containing suitable bacteria is incorporated into meat products the medium is so enriched that these dangerous poisonous cleavage products can now be made. Therefore, so far as jellied meats are concerned it is negligible whether the gelatine itself is of sufficient complexity for the formation of high order cleavage products.

Examination of Spoiled Jellied Meats

In all the specimens of spoiled jellied meats examined, liquefaction of the gelatine and decomposition of the meat began at the outside, indicating that aerobic organisms are the chief cause of spoilage. In nearly all cases the interior of the product was found to be perfectly fresh, even when the outside portion to a depth of one or two inches was completely decomposed, and gave off a putrid odor. This is important, since an unscrupulous dealer could very easily trim off the spoiled part and sell the unaltered central portion as fresh food. Such trimmed portions might be very dangerous since they might readily be soiled with the products of putrefaction or contaminated by injurious putrefactive organisms.

Aerobic and anerobic cultures were made from about a dozen specimens submitted for examination, but in no case were we able to demonstrate the presence of any member of the paratyphoid-enteritidis group. The organisms identified in most cases were B. subtilis, B. proteus and the B. mesentericus. In several anerobic cultures the B. welchii was found. A number of other spore bearing saprophytes were isolated but these have not yet been classified. This work is being continued with the view of classifying the organism most frequently found; but it is of course understood that the flora will not be constant in any two samples for many varieties of organisms may be introduced in the course of preparation and handling.

B. proteus vulgaris has been associated with food poisoning by a number of European investigators; but its causal relationship has not yet been definitely established. Nor is it clear to which factor the symptoms are attributable; some claim that they are due to the multiplication of the organisms in the body, while others hold that they are due to the production of a toxin.

The results obtained from our limited number of examinations would indicate that B. proteus vulgaris is often present in gelatine and therefore in the finished jellied meat product; and if this organism is capable of producing infection or intoxication, it is difficult to understand why cases of food poisoning are not of more frequent occurrence as the result of the ingestion of cold meats contaminated with it. The same applies with equal force to B. coli and B. subtilis which are said to produce poisonous cleavage products, though, as Rosenau points out, the reason that poisoning does not always follow their presence in contaminated meat may be due to the fact that the poisonous products of decomposition are present only at certain stages of the breaking up process.

The Sterilization of Gelatine and Jellied Meat Products

From the standpoint of meat packers, the most important phase of the problem is

to find some means of reducing the wastage. When it was suggested to them that the finished product might be sterilized in the final container and then protected against subsequent contamination, it was stated that a temperature sufficiently high to kill bacteria and spores would seriously affect the solidifying properties of the gelatine. The quality of gelatine for packing-house use is largely measured by the degree of firmness on setting. Some experiments were conducted to decide this point, and it was found that a jelly of good consistency could be held in an autoclave at a temperature of 240° F. for as long as thirty-five minutes without in any way affecting the product, but a poor flabby jelly did not set well after being heated much above the boiling point.

Upon the basis of the information obtained from these experiments, it was decided to put up some experimental packs with the view of finding out whether sterilization with steam would injure the finished product.

Experimental Pack No. 1

This set was put up to see whether spoilage could be prevented by careful packing. Just before packing the tins, the meat was boiled, the gelatine sterilized in flasks, and the container steamed for five minutes. As soon as the jelly had set the surface was covered with a thin layer of paraffin wax to prevent air contamination.

Experimental Pack No. 2

The tins in this set were prepared by the usual packing-house method, and were brought to the laboratory and subjected to fifteen pounds steam pressure for fifteen minutes, *i. e.*, sterilized in the final containers. The surface of the jelly was also protected with a layer of wax.

Experimental Pack No. 3

In this series the tins were prepared by the packer according to the usual practice, and they were neither sterilized nor protected by wax. This set was put up as a control.

All the tins of each series were held under conditions similar to those found in the average packing-house.

Result of Experiment

All the tins prepared by the usual packing-house method showed signs of decomposition in ten days. At the end of this period some of series No. 1 and No. 2 were uncovered and were found to be perfectly fresh. In sixty days the remainder of the tins were examined and some of those put up by the first method were found to be slightly mouldy, while all those sterilized in the final containers were just as fresh and as palatable as they were at the time of packing. At the end of the experiment the cans of meat were examined by men engaged in the preparation of jellied products, and were pronounced by them to be satisfactory in every respect.

The results of these experiments were brought to the attention of the management of one of the large establishments and an attempt is soon to be made to repeat the work on a large scale in the plant.

Summary

1, Contaminated jellied tongue was probably the cause of an outbreak of meat-poisoning in Toronto in 1917.

2. The containers in which the product is sold are not sterilized before use, the gelatine is frequently contaminated at time of packing, and the product is not sufficiently protected to prevent subsequent contamination. These are all factors in the wastage due to decomposition.

3. B. botulinus, B. enteritidis, or the hog cholera bacillus have not yet been demonstrated in gelatine or spoiled jellied products; the chief organisms present are B. proteus vulgaris, B. subtilis, B. mesentericus, and B. coli.

4. The sterilization of gelatine does not affect its solidifying properties, provided it is of good quality.

5. Jellied meat products may be sterilized in the final containers, and kept without deterioration for at least sixty days. Jellied meats put up by the ordinary commercial method show signs of decomposition in ten days when kept under usual conditions.

Acknowledgment

My thanks are due to Dr. F. Torrance, Veterinary Director-General for permission to publish this report, to Dr. Weaver, Dominion Meat Inspector Service, for assistance in conducting the work, and to Dr. McGilvray, Principal, Ontario Veterinary College, for placing the laboratory equipment at my disposal.

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The Mind of the Horse

By MAJOR OLAF SCHWARZKOPF, V. C., U. S. Army, Fort Russell, Wyo.

THE article of Lieut. G. H. Conn, published in the May issue of this journal and entitled, "What is meant by 'Horse Sense,'" needs a correction especially in the interest of the army veterinary service. It was undoubtedly prompted by the previous article on "horse sense" by Professor W. G. L. Taylor in the issues of September, October and November, 1918. The contents of the November issue are not known to me, but whatever ultimate conclusions Prof. Taylor arrived at in his account of the new "horse pedagogy" inaugurated by von Osten and Krall, it is evident that Lieut. Conn is antagonistic to the facts reported, although he does not state so.

It is also evident that he has taken his opinion from the "Manual of Veterinary Physiology," by Colonel F. Smith, 3rd edition, 1909, pages 448-453, "Psychical Powers," although he does not acknowledge the source of his information. What I object to is that he has copied only so much of the textbook as seemingly confirms his theories of the mental deficiency of the horse, making his story absurdly one-sided.

To exonerate Col. Smith on this particular point, it is necessary to cite his introductory remarks to the subject: "In attempting to define to what extent the faculty of reasoning exists in animals, we are treading on distinctly controversial ground."

And a footnote on the same page admits:

"We are aware that the majority of people will not agree with these views of the defective intelligence of the horse, but we are not alone in our judgment; see, 'The Points of the Horse,' by Captain Hayes, whose experience amongst horses in all parts of the world was very considerable."

Of course, Capt. Hayes's book is well known to army veterinarians and to many army officers, and his views are by no means concurred in by all American students of hippology. He was primarily a specialist in the training of horses for the rough and tumble game of hunting, and the hunter was the only horse for him. His book is instructive in many ways, and while some chapters are quite scientific, notably his account of locomotion, the rest are not, including his exposition on the intelligence of the horse. Captain Hayes certainly did not study comparative psychology.

It is realized by students of this subject that the simple horseman and the average veterinarian will continue to formulate his opinion on the mind of the horse by his ordinary, daily experience without seeking accurate information. He may, or may not, reach some general conclusion dependent on his interest or indifference to the subject. At best this will be illusory and empirical, and will be in favor of the horse or against it in proportion to his inborn sympathy or apathy to this animal.

As far as veterinarians are concerned, the causes of this fact are not far to seek. Already at college the student stumbles on the intricacies of the anatomy of the brain; he is bewildered at the physiology of this organ; and if now the psychology of the animal is touched upon by the "professor," he gives up all hope of ever understanding the entire thing. There is another cause. Some students and practitioners will say: "O well this is metaphysics; it has nothing to do with veterinary medicine!" May I reply here for once that comparative psychology is not necessarily a branch of metaphysics, but it is by right a branch of veterinary science, if we choose to make it so.

Here is an example: When in 1890 the first paper on meat-inspection was being discussed at a Chicago meeting of the U. S. V. M. A., the state veterinarian of Illinois, a bright man long since deceased, stated in perfect good faith that in his opinion we were going too far; that all we could do was to cut out the sick and injured animals in the stock-pens; and after the animal had once been opened in the slaughter-house, it was for the physician to decide whether or not the meat was fit for human consumption, or words to that effect. At that time he had many adherers among our colleagues. Today, any man advancing such a proposition would be liable to verbal lynching on the floor of the meeting-hall, not only because

meat-inspection has become a livelihood for many veterinarians, but particularly because we now consider it exclusively a branch of our profession on account of our special study and practical training.

A similar turn would result, if we once recognize the need of the teaching of animal psychology as a valuable adjunct to our training in the management of domestic animals, well or sick, particularly of the horse on account of the greater variety of his temperament. This can be demonstrated, if it is not already known to every thinking and observing veterinary practitioner.

Let me illustrate this point to those who as yet do not know it. The late board of examiners of applicants for the Army Veterinary Corps formulated this extra question: "What mental faculties constitute the so-called 'good dispostion' of the horse?" While the disposition of the mind, in man and horse. is a psychical problem, this was nevertheless a "practical question" and one that can be answered in a simple way by most student-officers of cavalry and artillery after a course in hippology. Yet, only about one in fifty of our veterinary applicants had any idea how to approach the subject. Unacquaintance with it was not counted against them, because it is touched upon only in a few select of our colleges, if at all. But we succeeded nicely in arousing the curiosity of the candidates, gave them a few minutes talk on the subject and thus saved them from exposing their ignorance in the frequent discussions with army officers concerning the management and care of the horse, and in the important question of suitability of disposition of horses for army purchase. It will not be denied, that similar problematic questions are frequently confronting the practitioner in civil life, and he, like his army colleague, can only solve them to the satisfaction of his inquisitive client if he has an intelligent conception of the subject. This is the scientific-practical aspect of the subject.

Then there exists a scientific-moral and ethical connection between the study of animal psychology and our profession, which we should never forget in our relations with the domestic animals. This is what happened to me, when a student. Before graduating in 1879, we were required, among other stipulations of the code of veterinary ethics, "To solemnly assent and affirm to uphold the dignity of our profession by following such system of treatment which, according to our ability and judgment, is best for our patients, and to abstain from whatever is injurious to their body or inimical to their mind."

I do not know how many of our colleges of today require the student to conform to this part of the oath of Hippocrates. But I do know, as others know, that comparatively few practice it knowingly or unknowingly, or as a matter of duty and good conduct. We have switched off from it, and we talk rather glibly today of the "humane treatment" of animals, not realizing that it is a subtle phrase, because the "humans" are among the most cruel of animals. I sincerely hope that I am not asked to submit facts. But this has been recognized by thinking and feeling men and women outside our profession; and as we have no "jus animalium" regulating the rights of domestic animals as had the ancient Romans, these good people—after 2,000 years of our "civilization"—had to band themselves together into "humane societies" for the protection of animals. I am personally heartily in sympathy with all of these benevolent societies, because they uphold the above oath and are not afraid to enforce it; and because they can finance their objectives. We can do no better now than to join these societies in order to have greater opportunity to fulfill our duty. But as far as our profession is concerned, we could have kept ourselves aloof from the moral tutorship and from the legal guardianship of these societies, if we had only shown the desire to remain freemen by the acceptance and practice of the simple code of ethics of the father of all medicine.

(To be continued.)

According to figures published by the United State Department of Agriculture, the farm horses lost from disease during last year were over 415,000; cattle from disease and exposure, nearly 2,247,000; swine from disease nearly 3,128,000; sheep from disease and exposure nearly 1,606,000. The money loss due to these mortalities would amount to more than $200,000,000.

Sheep Practice*

By E. T. BAKER, Moscow, Idaho

HAVING been asked to come and give a talk on sheep diseases from a practitioner's point of view, I shall take up this subject in a practical manner.

You must be prepared for your sheep calls or the county agent will take care of them for you. I am very sorry to say that the average veterinarian's knowledge of sheep diseases is meager. I don't claim to know very much about them myself, but having been asked some questions by sheep men, I have tried to gain a little information along that line.

Knowledge of Breeds of Sheep

What should the veterinarian who is a general practitioner do to fit himself for sheep practice? The first thing I would do would be to learn something about the various breeds of sheep. How many of you know the history of the sheep kept in your own community? Out West we have among other breeds, the Rambouillet, the Shropshire, Hampshire, Cotswold, Corriedale and the Lincoln. In the Missouri Valley territory perhaps you have some other breeds. I would advise you to become at least conversant with a short history of the common breeds in your locality. If you are not asked this by the farmer, the farmer's wife will ask you, and it is very embarrassing not to be able to answer questions.

Anatomy and "Mouthing" Sheep

Another thing, is a knowledge of anatomy. I remember when I was first asked about the age of sheep. I had about as much idea of telling age by the teeth as being able to tell the age of an aeroplane by the length of its wings—an old sheep man showed me how. A sheep under one year of age has no permanent incisors on the lower jaw; a yearling has two central incisors; at the age of two, or between one and two, the ones on each side of the centrals appear; at three years they get the intermediate incisors; when a sheep is four years old, it has a "full mouth." We occasionally observe "broken mouth" in ewes. This, however, depends upon the type of soil they have been grazing on. I have seen a perfect set of teeth in two-year-olds and some at eight or nine. Therefore, I should be very cautious about giving a definite answer regarding the age of sheep. It is about the first question asked of a veterinarian, and it is a very nice thing to be able to open the mouth of sheep and give a definite answer, qualifying when necessary, because of abnormal conditions existing. This makes a good impression upon your client.

In sheep, the anatomy of the suborbital glands differs from that in cattle. These glands often become filled with alkali dust and thistles. I have seen sheep with heads almost as large as an ordinary basket because of these glands filling up. I saw a case where a veterinarian was about to extract all of the molar teeth in an instance of this kind. We used a probe and found several thistles and pieces of cocklebur located in the suborbital gland.

Another thing causing trouble is affection of the interdigital glands. Many a case of foot rot and necrotic dermatitis has been diagnosed when it was merely a closure of this gland. Sheep men call it "worm in the foot."

Other things of importance regarding the anatomy of sheep are the capacities of the stomachs, which are from two to five gallons. You will always remember the location of the trachea if you ever have to operate on this part once. The trachea of a sheep is like a snake in the grass, it wiggles around so. If you set out to do any scientific operations on the trachea for the first time do them when there is no one about.

Wool

Another convenient thing to be familiar with is wool. Since the war began, the greatest interest has been evidenced in wool. Do you know what wool fibre is? Until I saw it under the microscope, I did not know the difference between the fibre of wool and a hair. Wool is shaped a great deal like hair, but has scales like a fish; these scales overlap each other and in the operation of felting, these scales

*Presented at the Missouri Valley Vet. Assn. Meeting, Feb., 1919.

interlap. In other words, wool interweaves, while hairs lie parallel with each other.

Catching Sheep

The next thing is the catching of sheep. Most men dive at a sheep like a man making a tackle on the five-yard line in a football game. It makes a poor impresson on the sheep men, to say the least. If you do not know how to catch a sheep, let the herder do it for you. It is better to let the sheep men do all manipulations, while you look wise, until you know something about it. A sheep is best grasped about the breast and on the hind leg, as one would take a sheaf of wheat. If the animal is not excited it will not create a disturbance. I usually have the herder catch the sheep and lay it on a table so that I may examine it carefully.

Maggots Cause Much Trouble

It pays to make careful examination of the exterior of the body of sheep in every case. I have been using a flashlight for this work. With the flashlight, it is possible to locate small wounds scarcely perceptible if a careful examination is not made where large cavities filled with maggots exist. These may be found on the inferior surface of the body.

Period of Gestation

The period of gestation in sheep is another question of importance. On the range it is about 145 to 150 days. The period of estrum usually lasts several days. Regarding these questions the average veterinarian is apt to say to the owner that he does not know, and consequently does not get the business. A man who has sheep practice forced on him will soon learn that it is one of the best paying practices. Nine years ago I charged one sheep man $80.00 for a call and he sent me a check for $100.00. Since that time nobody has had to send more than I asked for.

Classification of Diseases

After five years of experience in sheep practice, I have found that as a practitioner, it is impossible to remember everything, so for convenience I have divided sheep practice into four parts: first, infectious diseases; second, parasitic infestation; third, poisoning, usually by plants; and fourth, non-contagious diseases. If I get a call to a rancher's place, I can assume that his animals either have a contagious disease, parasitic infestation, plant poisoning or some non-contagious disease, 95 per cent of the latter being caused by errors of diet.

In making calls, I always take a quantity of bacterins with me for common infectious diseases, antidotes for plant poisoning, and just a few other medicines, because knowing the community in which I practice thoroughly well, I know about what to expect.

Infectious Diseases

Beginning a consideration of the four classifications of diseases, with the first group I have found that there are four common contagious diseases in my sheep practice. First, hemorrhagic septicemia, which from a rough and ready practitioner's standpoint may be diagnosed when all ages of sheep are dying. I was called to see a band of 3,800 last year in which sheep of all ages up to five years were dying from hemorrhagic septicemia. If sheep under a year old are dying, I usually find blackleg to be the cause of the trouble. For the diagnosis of hemorrhagic septicemia, I have found the laboratory was very helpful. I always protect myself in this way. If I find hemorrhagic septicemia lesions in the diaphragm, with no gas formation, I usually call it a sort of blood poisoning. I don't refer to it as hemorrhagic septicemia in speaking to the rancher, because he might think I was swearing. And that would be a dreadful thing for him to think. I say to him that I will send a part of the blood and a little bit of the tissue to the laboratory and that I am going to use bacterins, but am not sure the bacterins will protect his animals. I usually try to protect myself, because if it is not hemorrhagic septicemia, and blackleg instead, I can then use the blackleg vaccine. I had an experience of this sort last March. Animals were dying at the rate of 600 a day. Hemorrhagic septicemia bacterin was first used, but we wound up by employing blackleg vaccine, with no more loss.

A common disease is lip and leg ulceration, or foot rot. You must remember that there are two types of foot rot, differing widely. Simple foot rot caused by dampness, filth and pus germs, is a condition that is benign; animals so affected recover about as soon as they are put on dry land

or walked through lime or copper sulphate solution. Then there is pustular dermatitis, affecting the extremities, caused by the B. necrophorus. In these cases, if the owner is told that his sheep will be all right in a week or ten days after putting them in a dry lot, when you start away from his ranch, don't come back. In such cases, surgery is the only hope. Don't be afraid to cut off the entire foot if necessary. Remove all necrotic material down to the healthy tissue. Anthrax, when occurring, is found in localized communities.

Of the other contagious diseases, rabies should be mentioned, because of its prevalence in the Northwest. The principal symptom of rabies in sheep, is sexual excitement in the males. Finally the jaws become contracted and the animals die in a paralytic state. No convulsions are noticeable in cases of rabies in sheep. During the rabid or exciting stage, they grit their teeth and bite their tongues and have a wild look in the eye.

We have quite a lot of nodular disease in our country, caused by a minute parasite. We don't know where it comes from nor how to prevent it. I have found lambs dying from the disease at a very high altitude. Also, we have tetanus or lockjaw. This is to be observed following castration; 95 per cent of these cases are in lambs. In our country where there are great mountains, a lamb may be walking along and dislodge a stone which is caused to roll down the mountain side, and hit another animal on the head. This causes a clot on the brain. These cases simulate tetanus, but before diagnosing them as such, remember injuries to the head. At the same time, don't forget that tetanus is prevalent in lambs.

Another peculiar condition seen is septicemia. In our country it is usually occasioned by maggot infestation which causes a sapremia.

A common sheep disease in the Columbia River Valley, is goiter. The cause seems to be a lack of mineral salts. Dr. Welch, of Montana, has found one grain of potassium iodid per day, per ewe, will prevent it. By working together, we may come out a day and a half ahead of the county agents.

Parasitic Infection

The second group of diseases, parasitic infestation, is common everywhere. I should judge that in the Missouri Valley, parasitism is the greatest trouble among sheep. I try to remember parasites in this way: First, the external, and second, internal. We have considerable scabies. The lime and sulphur dip will eradicate this trouble. When I find scabies, I turn it over to the B. A. I. with my compliments. The next condition found in the way of external parasitism is ticks. I do not think the average sheep owner realizes how damaging ticks are. They cause restlessness and loss of weight, and may bring on other diseases In fact, I have noticed that these infested sheep seem to die more easily from contagious diseases than do others. I sometimes wonder if ticks carry contagious diseases.

Another external parasite is the maggot. I believe more veterinarians fall down on diagnosis in this condition than where any other condition exists among sheep. I have been called where the veterinarian in attendance was treating his first cases in sheep, where he was giving treatment for pneumonia, and giving bacterins, and still the animals were lost. In these cases I usually find maggots somewhere about the hind quarters. This condition is especially prevalent before shearing time, in the spring. Whenever you are called to see a sick sheep, the first thing I would advise you to do would be to roll the animal over two or three times and examine its skin; examine around the udder in ewes, also around the ears and between the front legs. Sometimes there has been found a hole not larger than a lead pencil where maggots have burrowed under the skin. I have found that one ounce of lysol to about seven ounces of coal-oil is effectual in these cases. Another remedy which I use much of, because of its low cost, is composed of 20 grains of pyoktanin blue, one ounce of lysol, to a quart of gasoline. I prepare this by the gallon in the spring, and find it very good to destroy maggots in sheep, and it does not hurt the sheep.

The internal parasites are of course, multitudinous. I think veterinarians get more calls for prevention of parasites in sheep practice than in any other branch. First of all, grub in the head should be considered. We are often asked how to prevent this condition and in reply we are

obliged to say that we do not know except by employing common sense. If a sheep man is not willing to give a sheep shelter to run into during the heat of the day, grub infestation commonly results. There is no way that I know of to prevent grub in the head entirely. It is said that good results follow inhalation of bisulphid of carbon, but this is dangerous. Lung worms, of course, are found mostly in lambs. The greatest trouble is to be able to differentiate this condition from inhalation of alkali or dust. When we drive a band of 3,000 sheep, the last 500 will have to walk through five inches of dust. Two parts of ether to one part of turpentine will give better results in treating lung worms than any other remedy. You may either put a sack of hay on the sheep's head or run them into a small building, making it airtight, and scatter sponges saturated with this ether and turpentine mixture throughout the building. Few sheep die as a result of this treatment.

The stomach worm is the great pest among sheep east of the Rocky Mountains. The strongylus contortus or stomach worm, looks like a band of reddish brown hair in the abomasum. Copper sulphate in 1 per cent solutions in two ounce doses will practically destroy the worms. I have found that it is best to go very lightly on this treatment in sheep that are greatly emaciated. Have the owner starve the animals all day, giving them only water. Then take about ten grains of copper sulphate and dissolve it in about eight ounces of water. Back the sheep into a corner and by means of a two-ounce syringe, administer the solution on the tongue very slowly. In the course of a few days repeat the treatment. I would caution you not to overdo the matter of treatment in stomach worm infestation.

Infestation by liver fluke has always been considered incurable but we are getting good results in these cases by starving the animal and giving two ounces of ethereal extract of male fern.

Gid in sheep is uncommon in our part of the country. The only logical course to pursue in this condition is to treat with vermifuges, plow up the pasture and move the sheep to another part of the range.

Plant Poisoning

In the third classification of sheep diseases where plant poisoning is the commonest cause, I will say this: You are liable to observe everything in the way of plant poisoning, and if you don't know what to give in cases of this sort, administer potassium permanganate and powdered alum, 15 grains of each in a pint of cold water. Or, you may administer tannic acid in dram doses. But the thing for you to do, is to become familiar with the poisonous plants which grow in your locality. Nobody can help you but yourself. In the summer, especially when sheep are first turned out on pasture, 98 per cent of deaths will occur from eating some poisonous herb. 2,200 head of sheep have been lost in two hours on the range, due to poisoning from death camas.

Non-Contagious Diseases

The fourth division of sheep diseases and the most puzzling of all, because we cannot receive aid from the laboratory in diagnosis, is the group of non-contagious diseases. The rancher loses one or two sheep and several others are sick. He naturally wants to know what is the matter with his sheep. The first thing to think of is errors of diet. In all of the diseases of this group, there are three things that you can always recommend with perfect safety. They are; first, a mile of exercise a day; second, change of feed; third, change of quarters. If then, the sheep continue to die, recommend a change of help, because you may be assured that your instructions are not being carried out. We are all familiar with the story of going out to see a sick horse where the man tells you the horse has been sick about half an hour, and when you go to the house for something, the wife remarks that she "wanted John to send for you day before yesterday." Conditions are the same in sheep practice. Don't believe everything they tell you.

First among the common non-contagious diseases of sheep, are digestive disturbances. We seldom get a call to treat bloat in sheep, but where we do, a teaspoonful of formaldehyde well diluted, and this followed with potassium permanganate, will remedy the condition. Constipation or impaction demands attention, and here barium chlorid and tartar emetic and a little powdered nux vomica may be employed advantageously. This is almost a specific in cases of impaction of the oma-

sum. Formerly, such conditions resulted in death. So don't forget barium chlorid and tartar emetic, five grains each.

In cases where digestive disturbances are due to spoiled forage, give of the sulphocarbolates. In chronic indigestion, administer from one-half to one pint of mineral oil.

Forage poisoning is something we all have to deal with, and I believe that a prognosis of death in enteritis in sheep is a good one to make, as a rule. Remember always, that a sheep has a compound stomach, and over 125 feet of gut, so that we must correct the trouble before it reaches the intestine, or the owner has another pelt to sell.

Diarrhea is a very common disease in sheep, but one which is very easily controlled by an entire change of feed and water.

I was called last spring to see a band of sheep and lambs affected with scours. They were being fed cottonseed meal, about a handful each, daily. I advised that this be discontinued, and alfalfa given instead, and that the animals be exercised. The owner thought this was poor advice, and was disappointed. I think he felt sore when he paid me. However, he followed my advice and the sheep got along all right.

I am not very much in favor of medicinal treatment in digestive disturbances of sheep, but have learned to place great dependence on biologics where they are indicated. I hope commercial firms will put out a complete line of biologics for sheep. I have found that hemorrhagic septicemia bacterin, when attenuated with phenol, gives better results than when attenuated with heat. Dr. Lytle of Oregon, was the first to call my attention to this.

Regarding the administration of biologics, the use of the average hypodermic needle in such work is unsatisfactory. It is entirely too long. When I have a large band of sheep to inoculate, or inject with the hypodermic syringe, I first arrange to have a table about waist high, in the corral chute, so that assistants may place the sheep on this table and thus greatly facilitate the work. In vaccinating sheep, one may employ either the route of the axillary space or the thigh. Have two men lay the sheep on its side; one man holds the uppermost leg upward, and the other man holds the lower leg down. In this manner the field of operation is very accessible. I prefer a solid metal syringe equipped with a short needle.

In administering blackleg vaccine, I have it greatly diluted for sheep. For instance, I should prefer to use two c.c.'s of a product rather than to use one c.c. containing an equal amount of killed organisms. Better results follow where the dilution is greater, and absorption is quicker. Always inject the vaccine quite deep. I use no antiseptic precautions, and after inserting the vaccine, the parts are massaged quickly and then the operator is ready for the next sheep, which another set of men has ready to place on the table, so you may keep walking back and forth doing your work without being obliged to participate in handling the sheep or to stoop over to make injections upon animals that are on the ground. In working with bands of 1,000 or 2,000 head, one soon learns to save himself.

Dr. J. E. Hodges of Maiden, N. C., and registered Duroc sow. Cesarean operation performed June 2nd by Dr. Hodges and Dr. Lynch, and eleven pigs removed, nine living and two dead. On June 28th, seven pigs living and sow completely recovered.

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The Eleventh International Veterinary Congress

THE tenth international veterinary congress was never held. The delegates assembled in London August 3, 1914, but owing to the outbreak of the great war that has just closed, was adjourned *sine die* at the close of the first session. At that time several years had intervened since the ninth international veterinary congress had been held, and the progress in veterinary science rendered necessary a world conference.

With all that has intervened in the past five years, such a congress is far more desirable and necessary now, and doubtless leading veterinarians in all countries are looking forward to the convention of the eleventh international veterinary congress at an early date.

The time required to prepare for such a congress as the next one must be, precludes its being held earlier than 1920, and as the summer months have been chosen heretofore for the convention, that would make it at the earliest, approximately a year hence. Coming so soon after the great war, it might appear that a congress of international character should be held in a country that did not participate in the war on either side. On the other hand, there being no country that remained neutral during the war of sufficient importance to justify the holding of the congress in it, it may be said to be a practical certainty that the next congress will be in one of the countries that were engaged in the war. Of such countries, we propose the United States as being the most suitable for many reasons. None of the preceding international veterinary congresses have been held in this country. The number of veterinarians in this country is far greater than the number in any other country. The number of applicants for membership would be much greater were a congress held in this country than in any other, and consequently the funds available for the expenses of the congress would be more easily obtained here than elsewhere. Of the great countries engaged in the war on the side of the Allies, it appears that the animosities and hatreds growing out of the war are likely to disappear earlier in this country than in France, Great Britain or Italy.

It is none too soon for American veterinarians to give this matter consideration, to inquire of themselves if they are ready to undertake the responsibilities of entertaining the next international veterinary congress and willing to put into it that energy and attention to the welfare of veterinary science the world over that will make it a success. If it is found that there is a strong sentiment for undertaking these responsibilities, steps should be taken at once to officially invite the international congress to this country in 1920. The matter should receive consideration at the A. V. M. A. meeting at New Orleans, and upon the action taken there, it is probable that official action by the Bureau of Animal Industry and by the Department of State will depend.

Dr. F. M. Wilson, recently returned from service with the A. E. F., has resumed his practice at Mechanicsville, Iowa.

Mixed Infection in Swine

THE term "mixed infection" as applied to diseases of swine that may complicate hog cholera or exist independently and offer difficulties in differentiating from cholera, seems in a fair way to lose some of its popularity.

Mixed infection has always been an unfortunate term to apply to this group of diseases of swine, which are probably no more "mixed" than are the diseases of other animals when they occur simultaneously with, or as complications, or sequella of other ailments.

At the meeting of the Illinois Veterinary Medical Association held during the past month, it was definitely shown, as is explained elsewhere in this issue, that no inconsiderable amount of these mixed infections are due to a specific cause and, in the usual acceptation of the term, are not infections at all but of parasitic infestation. The reader is referred to the article in this issue by Dr. Raffensperger for further particulars.

At the meeting of the Missouri Valley Veterinary Medical Association, also held last month, in a most excellent symposium on the subject of swine diseases, it was pointed out that there are eleven ailments of the hog including hog cholera that offer some difficulty in differentiating one from another and that these ailments may occur singly or combined in twos, threes, fours, etc., offering altogether an almost endless number of different clinical pictures. But it was further pointed out that there are a number of fairly important symptoms and historical differences that will enable the skilled, experienced and careful diagnostician to in the large majority of cases determine with a considerable degree of certainty the primary and most important ailment in a given herd of swine and knowing this, to select the best line of treatment either curative or prophylactic.

By common consent, hog cholera caused by the filtrable virus is admitted to be the most important disease of swine in this country and entitled to the first thought and consideration by the veterinarian when called to see a herd of ailing hogs. Of the "mixed infections," swine plague or hemorrhagic septicemia seems to be acquiring greater and greater importance in the eyes of veterinarians having a large swine practice, although it remains and perhaps is destined to remain a bad second to hog cholera. Following swine plage, pulmonary ascarid infestation is receiving attention. On the other hand, it may be said that the Bacillus necrophorus, while still acknowledged to be harmful to hogs under certain conditions, is not accorded the importance as a destructive agent that was given it some months or years ago.

Broad Minded Propaganda

ON the opposite page we reproduce a poster (much reduced) that is being distributed widely in Illinois by the Extension Service. Each of the 65 county agents in the state is supplied a quantity of these circulars and required to post them prominently throughout his county. They show conclusively the attitude of the Extension Department of the Illinois University on the matter of the treatment of swine diseases, an attitude that is sound and could be copied with profit by the extension service of many other universities and agricultural colleges.

Captain James Gregg, who carried out serum treatment for the prevention and cure of remounts for three years at Newport News, Va., has been decorated by the King, an Officer of the British Empire (O. B. E.) in recognition of the success of his work in the United States.

COMING MEETINGS

Ontario Veterinary Medical Association, Toronto, Ontario, August 6th and 7th, 1919.

American Veterinary Medical Association, New Orleans, November 17th to 21st, inc., 1919. Headquarters, Grunewald Hotel.

Are Your Pigs Sick?

Do They Look Like This? **Or This?**

The greatest losses in pigs occur before weaning. These losses can be largely prevented.

Do Not Try to Cure Sick Pigs with Patent "Cure-Alls"

CALL A COMPETENT VETERINARIAN WITHOUT DELAY

W. F. HANDSCHIN, Vice Director
EXTENSION SERVICE, UNIVERSITY OF ILLINOIS, URBANA

Army Veterinary Service

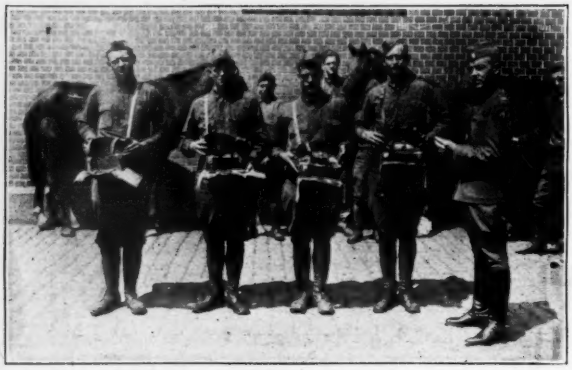
From the Office of the Surgeon General

Major George A. Hanvey, U. S. A.

Major George A. Hanvey, U. S. A., just returned from overseas service, has been ordered to the Veterinary Division, Surgeon General's Office, for temporary duty.

Captain Hanvey was assigned as Division Veterinarian, 84th Division, stationed at Camp Taylor, Ky., on January 14th, 1918. He was promoted to the grade of Major Veterinary Corps, National Army, on February 20th, 1918. As Division Veterinarian he sailed for France on September 9th, 1918, and arrived in Liverpool, England, September 21st, 1918, and proceeded to Ramsey rest camp, England, where the division stayed three days then crossed the English Channel from Southampton to Le Harve, France.

He remained with the 84th Division until November 8th, 1918, when he was transferred to the Advanced Veterinary Hospital No. 5 at Toul, France, as the Commanding Officer. On January 27th, 1919, he was transferred to the 88th Division as Division Veterinarian. On April 28th, 1919, he was again transferred to Veterinary Hospital No. 6 as Commanding Officer and placed on temporary duty in the office of the Veterinarian, Advance Sector, S. O. S., until Veterinary Hospital No. 6 prepared to leave France for the United States. This organization sailed from Brest, France, on the U. S. S. Agamemnon, June 10th, 1919, and arrived in Hoboken, N. J., June 18th 1919. They then proceeded to Camp Upton where the hospital was demobilized, on the completion of which Major Hanvey was transferred to the Surgeon General's Office.



INSPECTION

Third Army Evacuation Section No. 3, farriers and wallets, Captain Washburn, V. C., commanding, Coblenz, Germany, June 1, 1919.

Major Geo. B. McKillip

Major Geo. B. McKillip, U. S. A., was commissioned Major, V. C., Dec. 11, 1917, and reported for active duty on December 28th when he reported for temporary duty in the office of the Surgeon General, Washington, D. C. December 28 to January 17, 1918, took course of veterinary instruction at Washington, D. C. January 18, 1918, reported to Camp Upton, N. Y., as Commanding Officer, Veterinary Hospital No. 6, where this hospital was organized and trained prior to its transfer for overseas service. On March 27, 1918, sailed from New York with Hospital No. 6 on the S. S. Olympic and landed at Brest, France, April 4, 1918. April 4th to 7th, the Hospital No. 6 was at the Rest Camp just outside of Brest. The Hospital No. 6 was then ordered to Neufchateau, arriving at that station on April 11th. On September 12th relieved of command of Veterinary Hospital No. 6, Neufchateau, and assigned as assistant to the Chief Veterinarian of Base Section, Headquarters Bordeaux, Base Section No. 2. September 20th Headquarters, Base Section, was transferred to St. Nazaire. From September 21 to March 1, 1919, was assigned as assistant to Chief Veterinarian, Base Section, which was stationed at St. Nazaire. March 1, 1919, relieved as assistant Chief Veterinarian, Base Section No. 2, and ordered to Beaune, Cote D'Or, A. E. F. University, as Director of Veterinary Department of the College of Medicine until June 17 1919. Relieved from this duty and ordered to report to St Aignan for embarkation to United States. Left Brest on S. S. Great Northern June 30th

and arrived in Hoboken, July 6, 1919. Was ordered to Camp Dix, N. J., for demobilization. Transferred to Washington, D. C., for temporary duty in the Veterinary Division, office of the Surgeon General, and upon completion of which duty he was discharged July 12, 1919.

Promotion in the Veterinary Corps, American Expeditionary Forces

The following Majors have been promoted to the grade of Lieutenant Colonel: John H. Gould, Richard H. Power, Robert Vans Agnew.

The following Captains have been promoted to the grade of Major: Andrew E. Donovan, Herbert S. Williams, William C. Van Allstyne.

The following First Lieutenants have been promoted to the grade of Captain: H. P. Gill, F. C. Sager, J. C. Johnson, L. R. Smith, O. E. McKim.

The following Second Lieutenants have been promoted to the grade of First Lieutenant: C. A. Beall, F. H. Steele, R. C. Coulson, J. J. Riordan, W. A. Litton, E. C. Cavanaugh, G. W. King, W. H. Boswell, J. M. Atterberry.

The following Captains in the Veterinary Corps, retired, are promoted to the grade of Major on the retired list: Alexander McDonald, Daniel LeMay, Walter R. Grutzman.

The following officers have resigned from the Veterinary Corps, Regular Army, during the past month: Second Lieut. Henry L. Sommer, Second Lieut. Joseph W. Burby.

Assignments

The following orders of transfer and reassignment have been issued for veterinary officers during the past month:

MAJORS:

J. R. Jeffers, from temporary duty in the Office of the Surgeon General to Fort Keogh, Mont., for duty as the Veterinarian.

Frank G. Hershberger, relieved from present duties and directed to report Camp Upton, N. Y., for duty as the Camp Veterinarian.

Geo. A. Hanvey, Jr., from duty at Camp Upton, N. Y., to Washington, D. C., for temporary duty in the Office of the Surgeon General.

Andrew E. Donovan, from duty at Camp Dodge, Ia., to Camp Grant, Ill., for duty as the Veterinarian.

Chas. H. Jewel, from duty at Camp Dix, N. J., to Washington, D. C., for temporary duty in the Office of the Surgeon General.

CAPTAINS:

J. L. Hartman, from duty at Chicago, Ill., to Manila, P. I., for duty in the Philippine Department.

S. B. Ingram, from duty at Chicago, Ill., to Manila, P. I., for duty in the Philippine Department.

Clarence Loveberry is relieved from duty in the Philippine Department upon arrival of Captain Ingram and directed to report to San Francisco, Calif., to the Adjutant General for instructions.

J. R. Steffler, from Camp Dix, N. J., to Fort Oglethorpe, Ga., for duty as Post Veterinarian.

H. Clarke, from Camp Upton, N. Y., to Washington, D. C., for temporary duty in the Office of the Surgeon General.

J. F. Crosby, from Camp Grant, Ill., to West Point, Ky., for duty as Camp Veterinarian.

E. P. O'Connell, from Camp Upton, N. Y., to Washington, D. C., for temporary duty in the Office of the Surgeon General.

J. A. Weigen, from duty at Camp Dix, N. J., to A. R. D. No. 329, Camp Travis, Texas, for duty at that place.

R. R. McComb, from Camp Devens, Mass., to Chicago, Ill., for a course in instruction in meat inspection.

R. V. Vanskike, from A. R. D. Camp Sheridan, Ala., to Fort Oglethorpe, Ga., for duty as the Veterinarian.

N. Neat, from Camp Lee, Va., to Chicago, Ill., for a course of instructions in meat inspection.

FIRST LIEUTENANTS:

F. C. Waters, from Fort Oglethorpe, Ga., to A. R. D. No. 329, Camp Travis, for duty.

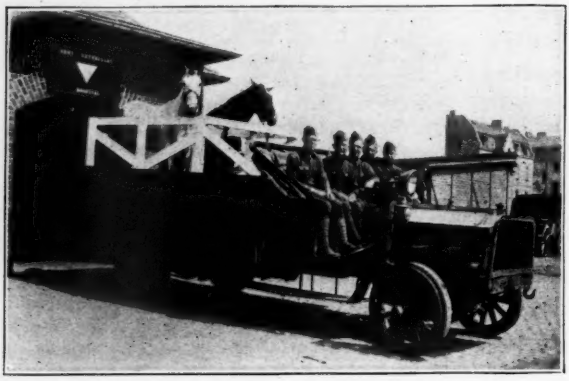
H. L. Williams, from Remount Depot, Fort Reno, Okla., to Camp Sherman, O., for duty.

Captain H. S. Eakins, Washington, D. C.

Captain Eakins is a graduate of the Colorado Agricultural College, Veterinary Dept.; served as assistant in pathology, University of Wyoming; secretary, Wyoming sheep board; inspector, B. A. I.; assistant in pathology, Veterinary Dept., Colorado Agricultural College; and now is in the Surgeon General's office wearing three service stripes.

J. A. Rennie, from A. R. D. No. 328, Camp Bowie, Fort Worth, Texas, to Camp Courchesne, N. M., for duty with the 9th Engineers.

H. M. Savage, from Hoboken, N. J., to A. R. D. No. 304, Camp Meade, Md., for duty.



The ambulance, Third Army Evacuation Section No. 3, Coblenz, Germany, June 1, 1919.

F. W. Lambert, from Camp Dix, N. J., to Camp Eagle Pass, Texas, for duty.

M. Sierveldt, Jr., from Chicago, Ill., to Camp Eustis, Lee Hall, Va., for duty as the Veterinarian.

F. B. Steinkolk, from Camp Dix, N. J., to Fort Sill, Okla., for duty as assistant to the Post Veterinarian.

C. J. Lambert, from Camp Dix, N. J., to Fort Huachuca, Ariz., for duty as Assistant to the Post Veterinarian.

O. W. Howells, from his present duties at Fort D. A. Russell, Wyo., to duty as assistant to the Veterinarian at that place.

L. A. Marshall, from Camp Dix, N. J., to Camp Grant, Ill., for duty with the 6th Division.

F. W. Taylor, from Camp Dix, N. J., to El Paso, Texas, for duty with the 8th Engineers, Camp Baker.

F. H. Woodruff, from duty with the 8th Engineers, Camp Baker, Texas, to San Francisco, Calif., for transportation to Philippines for duty in the Philippine Department.

SECOND LIEUTENANTS:

H. M. Wise, from Chicago, Ill., to Port of Embarkation, Hoboken, N. J., for duty.

L. T. Eagle, from duty at Newport News, Va. to Charleston, S. C., for duty at the Port of Embarkation at that place.

J. B. McNamara, from Camp Dix, N. J., to A. R. D. No. 323, Camp Funston, Kans., for duty.

T. J. Riley, from Camp Dix, N. J., to A. R. D. No. 305, Camp Lee, Va., for duty.

H. Leberson, from duty at Camp Jackson, S. C., to A. R. D. No. 329, Camp Travis, for duty.

C. F. Wilson, from Camp Grant, Ill., to A. R. D. No. 322, Camp Dodge, Ia., for duty.

Discharges

The following officers have been honorably discharged from the Veterinary Corps, United States Army, during the past month:

LIEUTENANT COLONELS:

H. E. Bemis, Reuben Hilty.

MAJORS:

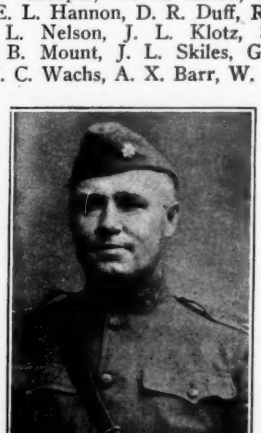
W. F. Guard, Walter G. White, John R. Scully, H. B. F. Jervis, Christian Wm. Greenlee.

CAPTAINS:

H. L. Messmore, C. W. Likely, R. S. Sugg, W. C. Nickel, E. C. Jones, M. S. Esslinger, J. S. Spikes, F. M. Lee, J. L. Lindsay, Ora L. Campbell, L. R. Smith, Daniel J. Meador.

FIRST LIEUTENANTS:

A. H. Schmidt, J. G. Bailey, Bernard Johnsen, H. J. Weaver, F. M. Hooper, W. A. Litton, R. Fenstermacher, E. L. Hannon, D. R. Duff, R. A. Branson, M. L. Nelson, J. L. Klotz, S. L. Pilgrim, E. B. Mount, J. L. Skiles, G. C. Armstrong, H. C. Wachs, A. X. Barr, W. G. Ellwitz,



Lieut. Colonel John H. Gould, Chief Veterinarian, 3rd Army, Coblenz, Germany.

C. B. Shore, F. E. Hill, G. E. McEvers, J. O. Schlegel, C J. Couchois, A. A. Leibold, E. O. Ericson, J. N. Campbell, S. W. Harrison, J. L. Hartranft, C. A. Collins, L. D. Potter, MacF. Campbell. E. A. Dowd, E. W. Youngblood, G. W. King, M. E. Agnew, Odell Archer, Clive

(*Continued on Page* 420)

DEPARTMENT OF

BOVINE PRACTICE

Edited by JOHN FRANCIS DE VINE, D. V. S.

Puerperal Eclampsia in the Cow

PUERPERAL eclampsia is looked upon in the human family as a common and serious malady associated with the puerperal state. It is not uncommon in the bitch, occurring occasionally in the mare and sow, but very little is written in veterinary literature as affecting the cow.

The only mention Williams* makes of it in his latest work, is to state that in one instance he observed a cow presenting the general symptoms of eclampsia; the condition lasted for about two hours when the symptoms passed into those of ordinary parturient paralysis.

Some writers add more confusion by recognizing puerperal eclampsia in the cow, but in discussing parturient paralysis put forth their belief that parturient paralysis in the cow and eclampsia in the woman are one and the same ailment.

While puerperal eclampsia is far from common in our dairy animals, still it occurs more often than some literature would indicate, and it surely appears to be a distinct entity from parturient paralysis.

After one has seen many cases of parturient paralysis in the cow in its various forms and phases and then relies on the text books of modern writers on the principles and practice of obstetrics in human medicine for information on the subject of eclampsia in the human family, as a veterinarian must, I cannot see how we can associate these two separately named maladies as one and the same thing, while on the contrary there is a pronounced dissimilarity of the symptoms presented in parturient paralysis of the cow when compared with those of puerperal eclampsia in the woman.

On the other hand, in the case of parturient eclampsia in the cow, which I have seen, there has been clinically a striking similarity to the symptoms described as being prominent in the human family, with the possible exception of the premonitory symptoms such as headache, which is said in many cases in the woman to precede the attack several days. Headache if present in the cow is not definitely determinable.

Differentiation

First we will discuss the dissimilarity of parturient paralysis in the cow and puerperal eclampsia in the human, and then point out the similarity between puerperal eclampsia in the cow and puerperal eclampsia in the woman. We do not judge a drug by the idiosyncrasy of an individual; neither is it customary to classify disease by the manifestations of the minority, therefore, we will discuss the symptomatology of the majority of cases.

First, the general aspect of the two ailments are quite opposite. In parturient paralysis the predominating symptoms *always* have a tendency to paralysis and coma, while in eclampsia in the human family and all animals, the predominating symptoms are excitement, convulsions and clonic spasms. While the excitement in eclampsia may be followed by coma, still there is a tendency to recovery and periods of ease. The reverse is true with parturient paralysis. Medication does not stay the progress of parturient paralysis and when coma becomes established, it is usually persistent until the end unless relieved by proper treatment (inflation of the udder).

In puerperal eclampsia if seen in the early or excitable stages before severe convulsions, paralysis or coma have set in, it is possible at times to check or ameliorate the spasms by sedatives to a point that may be termed abortive.

*Williams' Obstetrics, page 604.

I recall a case of this character in a high grade Jersey cow that had calved a few days previous. She had not eaten her morning meal or acted just right as the owner described it. As she was a highly prized family cow, I was sent for at once.

On arrival I found the cow in a small yard leading out from a shed. She was excitable as a startled deer would be in an enclosure, her head raised, muscles twitching and jaws champing. She presented the exact picture we have seen in cows when they have reached the maniacal stage in rabies, with the exception that she showed no tendency to attack anybody or anything, but was tractable and easily driven into the stable and confined in the stanchion. She was given a large dose of chloral per rectum as we were in no way certain she was not affected with hydrophobia and had no desire to handle her mouth; neither did we think it safe for the animal to attempt to drench her in her excitable condition. The chloral relieved her excitability considerably when it was supplemented by canabis indica and belladonna given per mouth with a syringe, with the result that there was a gradual lessening of the nervousness and convulsions and in twenty-four hours the animal had practically recovered.

Symptoms in the Woman

Prodromata:

The eclamptic attack may occur suddenly without warning but this is not the rule; almost always there are premonitory symptoms, headache, dizziness, tendency to nervous excitation or to sleep. Occasionally slight mental unbalance, twitching of the muscles, cramps in the calves, nausea, vomiting and disturbances of the special senses.

As the attack proper comes on, the patient falls to the ground unconscious, pupils dilate, the eyes and head are turned to one side, she opens her mouth and the jaws are pulled laterally; the whole body becomes rigid and drawn to one side in a tonic spasm. The features are distorted, the arms flexed, hands clinched, the feet inverted. This condition lasts a few seconds when the jaw opens and closes violently, the eyelids also, twitching begins in the face, perhaps one arm then one leg, then the whole body in a violent clonic convulsion which may throw the patient out of bed against any object. The tongue is protruded, the teeth may chop it; foam often tinged with blood comes from the mouth, the respiration is completely stopped, the chest being rigid, pulse high and strong; later it may grow so weak as to be imperceptible. Gradually the convulsions remit, the patient lies quiet, the heart thumping violently against the chest wall; stertorous breathing becomes established, coma supervening. Soon respiration quiets down, and in favorable cases the patient wakes up after a short period bewildered and severely sore in all the muscles.

The acts may be repeated from within a few minutes to one hour, or there may be no more but the convulsions may be commenced as late as the eighth day. With recurring convulsions the intervals become shorter and the patient lies in a deep coma all the time. Fever now begins. The pulse rate rises, fits recur from five to twenty minutes.

Symptoms of Eclampsia in the Cow

Usually the attack comes on shortly after parturition. Ordinarily the attacks are not sudden in their invasion and where animals are under close observation, there is usually the history of some change from the normal several hours preceding the pronounced symptoms.

The attendant may have noticed that there is a suppression of the milk flow or that the animal refused its feed, stood about in rather an indifferent way for a time or that there was occasional twitching or trembling preceding the agitation.

In most cases the first noticeably pronounced symptoms are excitability and spasms of the muscles of the trunk and extremities; grinding of the teeth and rotation of the neck are quite constant. These symptoms are very indefinite as to the period of duration.

When the disease progresses in a cow, she falls and lies prone on the ground, very much the same as a case of parturient paralysis. The limbs are extended and keep twitching and shaking; the mouth is half open and there is a short snappy champing of the jaws with more or less saliva flowing, but unless the case is rapidly fatal we will soon find it will differ from parturient paralysis in its intermittent character. After a lapse of perhaps fifteen minutes to, in extreme cases, several hours, the convulsions cease,

consciousness gradually returns, and if the convulsions do not return, her recovery is similar in character to that we see in the cow that is recovering after treatment from parturient paralysis.

If the convulsions recur they are apt to do so at short intervals and become so severe in character as to be followed by coma and death. In severe cases it is not uncommon to have the temperature rise to 105° F. or 106° F. In recovered cases animals have a staring look and show soreness in the leg and body muscles, for days. (Note this similarity in woman.) Recurrent attacks a day or two later, after the animal has apparently completely recovered, are not uncommon. Flemming* cites the following cases by different authors which are interesting and illustrate the variations in its manifestations.

CASE 1.

Mauri (Revue Veterinaire, 1876, p. 65) describes the case of a cow, four years old. and a primipara, which had calved and the placenta was expelled two hours afterwards. On the following morning the animal was seized with tremblings, refused all food, manifested breathlessness and looked anxious. On being led to the pasture to give it more air, it was perceived that it was weak in the hind quarters and in the short distance it had to travel it fell several times. It was put in a shed with a northern exposure and its calf being brought it remained completely indifferent to it. At two o'clock it fell and Mauri was sent for. He found it lying extended on the right side, the respiration appeared to be suspended and it was difficult to perceive the movements of the flanks; the pulse was imperceptible, but the heart's beats were strong. The tongue hung out of the mouth and the air expelled during perspiration carried a large quantity of foamy saliva with it. The senses appeared to be completely abolished and the eyeballs, turned greatly upward, looked fixed in a remarkable manner. The limbs were rigidly extended and they with the trunk jerked in such a violent manner that the whole body was shaken without being displaced. The udder was not flacid and milk of a good quality was readily obtained from it. Mauri thought it was a case of vitulary fever and ordered the necessary treatment. After six o'clock in the evening while preparations were being made to carry out his prescriptions, the cow got up and stumbled towards the side of the shed where its calf was standing. During the night it ate and ruminated. Next morning at eight o'clock there was a new attack. The premonitory symptoms lasted for about half an hour and the animal lay until half past nine. At mid-day it did not present any signs of the disease. It had no more attacks but the owner apprehensive of future danger sold it two months later and Mauri lost sight of it.

CASE 2.

Calmettes (ibid., p. 67) mentions that a four year old cow gave birth to a calf during the night in quite the natural manner and during the following day it ate and ruminated as usual. Toward six o'clock in the evening it suddenly commenced to tremble and to stagger in its hind limbs so that it could walk only with the greatest difficulty. At seven o'clock Calmettes noted that the hind quarters were very feeble, the general sensibility appeared to be increased, pressure in the dorso-lumbar region caused much pain, the skin was very hot, and the respiration deep and hurried. The pulse was strong and quick, the mucous membranes somewhat reddened and the muzzle damp. Counterirritants were applied to the hind quarters and draughts and emollient enemas administered. At one o'clock in the morning he was called again. The animal had fallen on its side; the general sensibility was diminished and the skin was very cold. From time to time it was remarked that all the extensor muscles of the limbs were convulsed, which threw the latter in rigid extension, though when seized by the hands they could be flexed and moved about. The sensorial functions were completely abolished and the skin could be pricked and incised without inducing the least movement. The eye which was generally fixed pirouetted in its orbit, from time to time; while it could distinguish nothing and could be touched without betraying any sensation, there was also loss of hearing. At this time the respiration was about normal—eighteen to twenty respirations in a minute; the pulse was small and imperceptible; the heart's beats strong; the mucous membranes rather pale than red and the muzzle dry.

*Flemming, page 684-85.

During expiration there was a labial souffle, and an abundance of foamy saliva escaped from the mouth. The animal remained in this condition for six hours. Towards seven o'clock next morning when about to send for a butcher, the limbs became rigid and were seized with convulsions, which extended to the entire body. As if by enchantment the animal placed herself on her sternum, raised her head in the normal position and finally got up, though with difficulty; it remained in a somewhat deep coma for about an hour. In the evening it had a second attack, there being general agitation with hurried respiration and weakness of the hind quarters. Soon it fell, had numerous convulsions and manifested the same general insensibility it displayed in the morning, remaining paralyzed however for only three hours. Next morning it appeared to be quite recovered.

Fifteen months previously and eight days after parturition this cow had had an attack when returning from pasture; being suddenly seized with tremblings it staggered and fell. In half an hour afterward it was completely insensible and sensationless; the respiration was almost normal, the pulse imperceptible, though the contractions of the heart were powerful and all the symptoms already enumerated were present but became more rapidly developed. The convulsions continued for two and a half hours.

CASE 3.

Lafitte (ibid. p. 70) mentions that a cow calved in the most favorable manner and four hours afterwards became agitated and restless; soon afterwards there were convulsions of the muscles of the trunks and limbs and so much weakness set in that the animal could not stand. The tongue was often projected from the mouth and foam flowed therefrom; the cow could hear and see during the attack. The pulse was intermittent and the respiration moderately increased. In about ten hours it arose and gradually recovered. Two days after, it had another and final attack which lasted three hours.

CASE 4.

The same writer (ibid. p. 70) relates that a cow which had calved a few hours before was seized with persistent convulsions and great general weakness which rendered standing impossible, presenting in fact all the symptoms of the previous case. This attack continued for three hours, and another followed on the same day. Then an interval of a day elapsed when the fits succeeded each other so frequently and with so much intensity that the animal died from asphyxia.

Eiology

As to the cause nothing definite is known. The theory that eclampsia is due to an intoxication, is a toxemia is most generally accepted. The possibility of its being of a nervous origin is not entirely and satisfactorily eliminated.

Differential Diagnosis

As with parturient paralysis in the early stages, the erratic character of the onset might make an immediate diagnosis difficult or impossible; if the listless or paralytic symptoms predominate, its association with the puerperal state might easily lead one to the conclusion that one is in the presence of a case of parturient apoplexy; while if the nervous or eclamptic symptoms overshadow all others and the case is not closely associated with parturition, one would be justified in a guarded diagnosis, considering the possibility of rabies. This thought would be particularly more justified if in a location where rabies was more or less prevalent, and in such a locality, the possibility of rabies could not be instantly and prudently set aside, even in the listless or paralytic cases, since it is well known that these two symptoms are often the principal manifestations in the cow in the dumb form.

However, the history and behavior of the ailment as it progresses will in time make clear to the capable man, the malady he is dealing with, and a delay in diagnosis should cause him to be regarded with no less ability by his client if he has given proper professional information, as to the necessity of putting off a positive decision and taking proper precautions until the behavior of the malady gives him more information.

Treatment

Narcotics to relieve the convulsions, diuretics, diaphoretics and cathartics are indicated to prevent recurrence. After the acute symptoms have passed, frequent small doses of sodium chlorid (well sweetened with molasses or syrup) to induce copious drinking, is a valuable treatment to guard against recurrent attacks.

Queries and Answers

Nothing Unfair About It

I am an American graduate holding a commission in the Royal Veterinary Corps of England. I have put in nearly four years of mighty hard work for the British Government. American graduates may not practice in England and are not recognized there. If Englishmen can practice in America, why can't we practice in England? I have spoken to many English graduates, and about one-third of them tell me that on their release from the army they intend going to the United States to practice. This seems a one-sided affair. Why shouldn't American veterinarians be permitted to practice in England as well? I should like to locate in England when out of the service. A. V. C.

REPLY: Licensing or not licensing a man to practice in this or other countries should be a matter of qualification and not of trade or reprisal. The whole theory of examinations and other restrictions governing the licensing of practice in veterinary medicine, human medicine, pharmacy, nursing, etc., is based upon protection of the public. A certain standard is required of those licensed to practice veterinary medicine, not for the good of the veterinarian nor the veterinary profession, but for the protection of the livestock industry and of the public. Viewed on this basis, it is not of the great importance whether American veterinarians are recognized in Great Britain or British veterinarians recognized in America. The question of importance is, are any and are all applicants for licenses to practice qualified for such practice? If schooling alone were sufficient to qualify all who graduate, there would be no need for examinations to check up on the work of the colleges, yet every state in the country not in dire need of veterinarians examines graduates. Where the need for veterinarians is greatest, the requirements for license will be least. Where the need for veterinarians is least, the requirements will be high. One may see this in the United States. Many of the southern states license a man upon a showing of his diploma alone. In some of the western states where the number of veterinarians is insufficient, the examination is quite perfunctory and almost no graduates ever fail to pass, while in New York and Illinois, probably fewer than half of the graduates applying for examination are licensed. Minnesota, Ohio and Iowa, use a discrimination that refuses license to many graduates. Would you say that because Oklahoma needs veterinarians and will license a man because he has a license in Illinois, the latter state, which is well supplied with veterinarians should likewise license any practitioner from Oklahoma who moves into Illinois? The average standard of veterinary colleges in Great Britain is, or rather has been materially higher than the average standard of veterinary colleges in this country. This is not saying that the average ability of their graduates is higher. But the term is longer than it has been in most American veterinary colleges and longer than it is in some of them now, and the entrance requirements are higher than it has heretofore been in many of our schools. If England can get all the veterinary practitioners she needs and even a surplus, meeting these higher educational qualifications, does it follow that because many parts of America need veterinarians and are glad to get men from the English schools, England should in turn accept graduates from American schools that do not meet her own standards?

American veterinarians who have served in the Royal Army Veterinary Corps are doubtless deserving of consideration from Great Britain, and I believe they will get it. The Royal Veterinary College has already accepted 16 Australian and 4 Canadian graduates as students in the Royal veterinary colleges, and they are to be allowed to appear for their final examination (M. R. C. V. S.) after only two terms in the R. C. V. S. This is a concession made solely because of services that these men have rendered Great Britain in the army, for they are all army veterinarians. No other American veterinary graduate has ever been offered the opportunity to appear for final examination in the R. C. V. S. without spending four years at one of the affiliated colleges.

From the best one can learn of conditions surrounding veterinary practice in England, there are few, exceedingly few, American veterinarians who wish to go there to practice, and owing to the extraordinary changes that are occurring in veterinary practice in this country, there are perhaps few British veterinarians who will make a real success here and be glad that they came. Wthin the past two years, veterinary practice over much of this country has come to deal more largely with hogs than with any of the other animals. Cattle practice is a matter of

secondary importance, and equine practice has almost disappeared among the practices of a very large number of veterinarians. Small animal practice is not important. Men wholly unfamiliar with American customs and American practice but of great adaptability and the necessary professional ability, can doubtless succeed; but the British practitioner whose habits have become somewhat inflexible is courting disappointment to leave a fair practice in Great Britain for the same kind of work in this country.

TREATMENT FOR PANTING HORSES

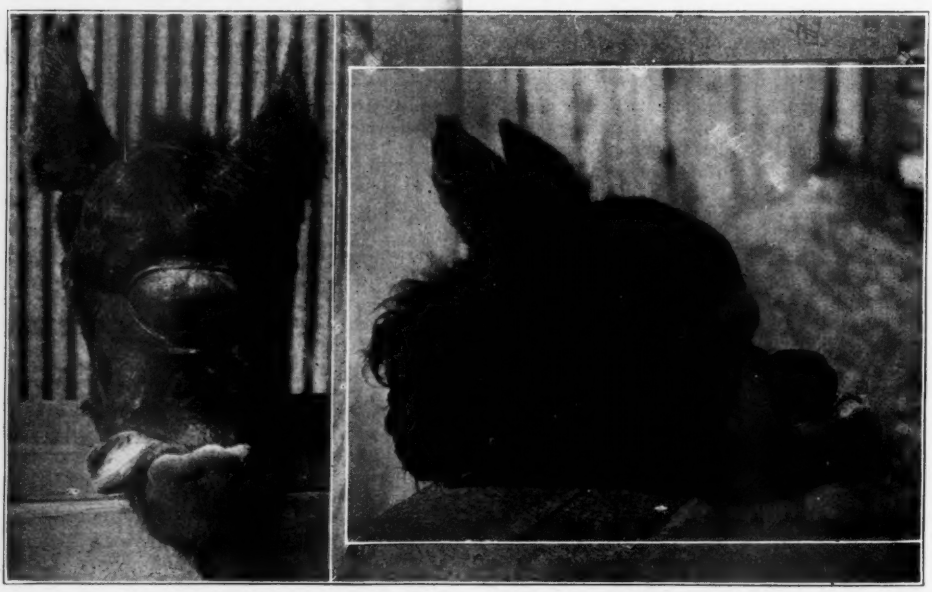
I should like some line of treatment for panting horses, non-sweaters, etc., as so many animals are panting this season. L. L. L.

REPLY: The condition you mention is by no means rare. It is exceedingly difficult to handle at this time of the year, although quite amenable to treatment if taken at the proper season. Give the horse a dram to a dram and a half of ammonium chlorid and half a dram of nux vomica in the feed three times daily. Have him well groomed and washed at least every other day. Give occasionally full doses of sweet spirits of nitre; perhaps about twice a week will be best. Do not overwork the animal. Work him as much as practicable during the cooler hours of the day and as little as possible during the extreme heat. These cases can be cured to a certainty if treatment is commenced before hot weather begins, say in March or at the very latest, early in April. Clip the horse closely. Administer ammonium chlorid, nux vomica and potassium nitrate and get him into and used to hard work before the hot days of the spring appear, the idea being to stimulate respiration and particularly to free the respiratory mucous membrane from exudate. In addition give diurectics and sudorifics, and then use common sense in working the animal throughout the summer. I have seen such cases cured many times, but a single half day and even less of overwork in extreme heat can, of course, produce a new attack.

DEPRAVED APPETITE IN A COLT

A colt which came under my observation a short time ago is rather a puzzling case to me. It is a three or four months old animal seemingly in normal health but persists in eating its mother's mane and tail. At first it began eating the mare's tail and after having eaten nearly all of it, the colt now has made a big headway on the mane. I am unable to find any clinical symptoms of sickness. Could this be the result of any intestinal parasite? L. S. B.

REPLY: Cases of aberration of appetite of the kind you describe in colts are exceedingly rare. In horses and particularly in mules two or three or four years old, they are common. This colt might be given some worm treatment or at least a good cathartic and perhaps it might be well to induce it to drink cow's milk. Conditions of this kind in all animals are due to a lack of some needed element in the diet more often than to anything else. It is just possible that there is some deficiency of this kind in the mare's milk.



Cyclops in a foal, delivered from a gray Percheron mare, May 8, 1919. The sire was also Percheron. The foal seemed fully developed and normal otherwise, except the head. There was a complete absence of nostrils. A. Quinn, Sycamore, Ill.

Department of Live Stock Poisoning

By L. H. PAMMEL, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

Readers are urged to take advantage of the opportunity offered by Dr. Pammel, for the identification of specimens of supposedly poisonous plants. Two good-sized specimens, carefully packed, should be sent to him direct, with such history as may be available. Simply mention that you are a reader of the AMERICAN JOURNAL OF VETERINARY MEDICINE and no charge will be made for this service.

Favus in Chickens

B. A. Beach and J. G. Halpin in an article "Observations on an Outbreak of Favus"* find that favus is widespread, especially in chickens which seem to be the most susceptible of all poultry. They report several outbreaks in Wisconsin.

"In fowls it begins as a white, scaly deposit on the unfeathered portions of the head and may spread to the feathered parts of the skin, but never extends to the internal organs."

The cause of the disease is a parasitic fungus *Achorion Schonleinii.*

"Favus manifests itself clinically in the form of a dry, white, scaly deposit, which usually appears first on the comb and then spreads to the face and wattles. In advanced cases the feathered portions of the body are attacked to such an extent that the skin is denuded of feathers. As long as the disease remains localized about the head the general health is unimpaired. In such cases the egg production does not seem to be interfered with. Where both the neck and body are involved, constitutional changes may be noted. These disturbances are probably the result of absorption from the necrosed epithelium and of bacterial invasion. There is evidently no toxin produced by the fungus.

"The first case of favus that came to our attention was in the flock on a farm not far from the poultry yards of the experiment station. These chickens were allowed to run at large, but could not come in contact with the birds in the experiment station yards, as these were fenced. The case mentioned above was discovered in October, 1913, and the bird taken to the university poultry building.

"A careful watch was kept on the flock where the first case was found. In fact, one of the writers has handled all the birds on this farm and examined each bird carefully three times since the first case was discovered, but has never been able to detect any other cases there. The owner, who is quite a careful observer, states that he had never observed a case prior to the cock bird which, we believe, introduced the original infection. Furthermore, this bird was raised on the farm. No new stock had been introduced on that farm for at least three years, and, so far as known, no other stock mingled with this flock."

As to treatment the authors recommend as follows: "After much experimentation with lysol, tincture of iodin, and other recommended remedies it was found that an ointment made of formaldehyde and vaseline was far more efficient than any of the other preparations. This ointment may be prepared by placing vaseline in a Mason fruit jar and heating it in water until the vaseline melts. Then 5 percent by weight of commercial formaldehyde is added. The cover of the jar should be tightened immediately and the mixture shaken until the vaseline hardens. One or two applications of this preparation rubbed thoroughly into the lesions usually will suffice."

*Jour. Agrl. Research 15: 415-418, p. 31.

Suspected Poisonous Plant From Arkansas

Dr. S. L. Gustafson of Searcy, Arkansas sent two specimens of suspected poisonous plants with the following letter:

"I was called to the farm of Dr. Moore today to post a year old steer that died in the night or early morning. Upon arrival we found a young steer in fair condition slightly swollen.

"There was no history connected with the case, except that he was in apparent good health last night. There had been five others die on the same premises within the past three weeks, all showing the same symptoms. They were grazing on a low, swampy, wooded pasture. On post-mortem examination we found no lesions, except a well marked gastro-enteritis, with sloughing of the mucosa of the rumen. The intestinal contents had a peculiar sour odor. The symptoms given us were: profuse salivation, efforts at vomiting, staggering, coma and death in from two to six hours. There was some presence of toxic vegetable or weed. I secured three specimens. No. 1 a vine commonly

called poison oak. I noticed the cattle had been eating the leaves of these vines, the vine proper clinging to the trunk of the tree. No. 2 was a peculiar weed to me, and I am, therefore, enclosing it to you for your inspection. Please examine at your earliest convenience and write me the result, direct, as I am very anxious to know if either of these specimens are causing the trouble."

The plants sent were determined as a common crowfoot (*Ranunculus abortivus*) and a species of smilax, a member of the lily family, which has not heretofore been recognized as poisonous. The buttercup, like many other members of this family are acrid and some are quite poisonous (larkspur and aconite). The buttercup is regarded only as acrid. In my "Manual of Poisonous Plants" I have the following to say in regard to buttercups.

According to Basiner, the oil of ranunculus acts, in warm-blooded animals, as an acrid narcotic, producing, in small doses, stupor and slow respiration; in larger doses, also, paralysis of the posterior and anterior extremities, and, before death, convulsions of the whole body. The acrid action is shown by a corrosive gastritis and by hyperemia of the kidneys, more particularly of their cortical substance. *Anemonin* causes similar symptoms, but is followed by no convulsions, nor does it irritate sufficiently to corrode the organs, as the oil does.

Dr. Millspaugh mentions especially the *R. bulbosus* as having a peculiarly powerful irritant action upon the skin, whether applied locally or internally.

Murray states that a slice of the fresh root (bulb?) placed in contact with the palmar surface of a finger brought on pain in two minutes; when taken off, the skin was found without signs of extra circulation or irritation, and the itching and heat passed away; in two hours it nevertheless returned again, and in ten hours a serious blister had formed, followed by a bad ulcer, which proved very difficult to heal.

An interesting observation regarding the possible effect of *R. acris* on pregnant cows was reported to the author by his brother, F. M. Johnson. In a herd of cows pastured for years in succession in an old field thickly beset with this weed, abortion was frequent and troublesome. As soon, however, as the pasture was broken up and the herd moved to another part of the farm in which the plant did not grow, abortion disappeared. Now although, as stated above, domestic animals avoid this plant, yet when feeding where it is very abundant they must occasionally swallow it accidently and though there is no positive proof that the abortions were due to the plant in question, the facts as stated are interesting and significant. It is at least possible that ranunculus exerts an influence upon the reproductive organs like that which is claimed by some for pulsatilla.

A Supposed Case of Poisoning From the Cat-tail Fungus

A few weeks ago the writer received a letter from Dr. C. C. Clay of Marshalltown, Iowa, stating that calves had been poisoned in a little pasture. The letter from Dr. Clay reads as follows:

"On the evening of June 11th I was called to post a calf owned by a Mr. Fuller. He said that in the morning of the same day one of the seven calves turned in a small orchard pasture of about one acre had become sick and in about half an hour had died. The one I was called to hold an autopsy on had acted the same as the first calf and had lasted about half an hour from the time it was taken sick till death came.

"Autopsy showed nothing but slight gastro-enteritis, the bowels containing a normal amount of food. No evidences of tympanites was found.

"Mr. Fuller said the two calves had shown symptoms of severe colic; moving around the pasture, bellowing and having a desire to lean against the fence or a tree and press the weight of the body. The muscles trembled and at times showed convulsive spasms. Breathing became fast and difficult. Then a stupor came on, staggering and the calf would fall and die.

"The remaining calves were removed to a barn and a cathartic given each, although they all were acting normal.

"On searching the pasture we found a cat-tail fungus growth on a grass, samples of which I have sent to you. This grass had been eaten freely by the calves but the name is unknown to me, not being common here. The pasture had cherry and apple trees in it as well as plenty of blue grass and white clover.

"These calves were about two months old and had been getting nothing but fresh water besides the pasture feed.

"An hour after I returned home Mr. Fuller called and said one of the remaining five had died, showing the same symptoms. By the next evening five of the seven had died, all under the same conditions. The other two are still alive."

The writer inspected the place and found the following condition. The calves had been in the pasture all spring. They had eaten blue grass, white clover and the tops of Terrell grass or wild rye (*Elymus virginicus*). This grass was growing abundantly along the fence; the tops had been eaten off. About ten percent of the plants which had been eaten off were attacked by a parasitic fungus known as the *cat-tail fungus* (*Epichloe typhina*). Dr. Clay and Mr. Fuller observed the fungus and thought it might have caused the trouble; Mr. Fuller stating that the recent wet weather had caused the fungus to appear. The infection, however, must have occurred much earlier, the fungus becoming more conspicuous because the tops of the grass had been removed by the calves. The

fact that the fungus had been suspected interested me very much, because it belongs to the same family as ergot, the *Hypocreaceae*. So far as I know, there are no reported cases of poisoning from this fungus, although the fusarium which occurs in wheat has been suspected and the perfect form of this fungus Gibberella also belongs to this family. One would naturally think that the cat-tail fungus might be injurious.

The cat-tail fungus occurs on various grasses like orchard grass, quack grass, wild oats, etc., the Terrell grass being a new host. The fungus produces a creamy white mass around the stem of the infected grass, near the upper sheaths. At first the fungus has a velvety appearance. The mycelium is in the interior of the plant causing the part of the plant above to die because the supply of nourishment is cut off. In this stage of the fungus a large number of one celled spores are produced. As the mass becomes older it changes from a whitish to creamy and then a blackish color. This contains the perfect spores of the fungus. Experiments will be conducted to determine whether the fungus is poisonous. Has anyone made any observations on the fungus?

Poisoning From Cow Bane

Cow bane has white flowers, the roots are in fascicle.

It is common in low ground, throughout the northern states, especially in Iowa, Minnesota and parts of Illinois. The best way to destroy the weed is by pulling it, where the ground is to be used for meadow. It grows rapidly in the spring, where the ground contains considerable moisture. Not much injury will result where the weed is dried and properly cured, as the toxic principle is then destroyed. Injury results mostly from the roots in the fall and winter, and in early spring. If the weed is to be pulled I would suggest that the person pulling it does not come in contact with the plant, but it should be pulled with gloves over the hands, as there is some toxic principle in the green plants. Several cases of fatal poisoning have come from this kind of contact, the poisoning resembling that of poisoning from ivy. Poisoning seems to be more active where perspiration is going on.

REPORT ON ULCERATIVE LYMPHANGITIS IN THE A. E. F.

(*Continued from Page* 391)

inoculations resulted in the formation of typical lesions after the animals were evacuated to the rear.

Conclusions

1. The fact that streptococci were found in such a very high percentage of the cases and in the majority of the cases in pure culture and also the fact that the strains injected into laboratory animals proved pathogenic, caused the belief that this organism is probably the cause of one form of ulcerative lymphangitis.

2. Two predominating types of lesions were encountered; the smaller, rapidly forming one and the larger more slowly forming and usually painful lesion.

3. By far the greater majority (81.08 per cent) of lesions developed on the hind limbs, particularly on the exposed parts.

4. Ulcerative lymphangitis is easily confused with glanders.

5. The mode of infection is undoubtedly through breaks in the continuity of the skin.

6. Bacteriological diagnosis of the various forms of lymphangitis is a comparatively simple matter. Whole blood agar plates were found very satisfactory for ulcerative lymphangitis and direct smears for epizootic lymphangitis.

7. Surgical and medicinal treatment of ulcerative lymphangitis as carried out by the writer was found quite satisfactory in the limited number of cases treated. The results of vaccine treatment were encouraging.

Various causes made it impossible to carry out the investigation during the summer and fall of 1918 to the extent originally intended. Conditions required such urgent attention in view of the vigorous campaign that was being conducted aganst the Germans that all work not directly bearing upon an early winning of the war had perforce to be neglected. Our hospital was changed to an evacuation hospital, new officers were assigned and some of the older ones, including Capt. Wright who had for some time overseen the clinical work, ordered to other units; animals were sent to a distant farm and then later returned, etc., causing irreparable confusion in the records. And finally in November, 1918, the new commanding officer assigned there a few days previously ordered all the remaining 83 animals suffering with ulcerative lymphangitis in various stages branded as inspected and condemned, during a two days absence of the writer, without first acquainting himself fully with the nature of the work that was being conducted with these animals, thus bringing the entire investigation to an ill-timed close.

ARMY DISCHARGES

(*Continued from Page* 410)

Daly, H. F. Nimphius, R. H. Schneider, G. W. Hunter, David M. Smith, J. H. Hewitt, H. C. Kutz, C. A. Beall, Nelson N. Lefler, Anthony V. Jandernoa, Redfield C. Mills, Alfred T. Baesxler, Wm. M. Thompson, Elmer Wm. Berg.

SECOND LIEUTENANTS:

W. H. Hauer, H. B. Mitchell, C. P. Lunneen, G. L. Allen, H. P. Bonnikson, E. S. Ring, E. E. Lange, D. W. Nicholas, S. P. Bolstad, Wm. W. Yard, F. Low, R. W. Cates, P. F. Carr, C. M. Dee, E. A. Gilmore, H. W. Ayers, L. W. Ingram, J. N. Hunter, J. E. Gilfillan, W. R. Peeler, H. E. McLaren, H. J. Gohde, Max Danziger, P. B. Silvester, F. H. Schroer, D. W. Kennamer, S. M. Turner, H. G. Weigand, J. R. Kreger, W. C. Schultz, Loren Flora, R. A. Showalter, F. A. Burlington, R. C. Gilmore, D. B. Wilson, F. E. Kitchen, S. B. Watson, H. R. Hornbaker, H. K. McIntosh, F. C. Heninger, C. C. Neidig, W. U. Lemons, G. L. Schaefer, G. M. Parrish, L. E. Webster, E. L. Shuford, Jr., C. Parker, J. H. Batsche, W. H. Lynch, Martin L. Walter, R. J. Poff, R. A. Devlin, R. L. Wolfe, Sherman L. Bratton, J. T. Quarll, Walter I. Wilkins, H. L. Armstrong, Glenn R. Bach, Clark S. Burgett, George H. Elliott, Roy E. Selement, Samuel F. Lipton, Hugh D. Laird, Harry L. Cotton, Noel C. Elberson, George Wm. Clark, Lawrence B. Adams, John J. Wermuth.

Officers' Veterinary Corps, United States Army

	On duty June 11, 1919	On Duty July 11, 1919
Colonels	0	0
Lieutenant Colonels	5	6
Majors	74	68
Captains	193	182
First Lieutenants	430	382
Second Lieutenants	432	357
Total	1126	995

VETERINARY LABORATORY SERVICE

The Army and Navy Register of June 21st has the following to say about the laboratory services rendered by the veterinary corps:

"In keeping with a completely organized veterinary corps, a laboratory division has been established in the United States for army veterinary work. At the beginning of the war the services of Dr. S. H. Gilliland, director of the Gilliland laboratories of Ambler, Pa., were fortunately obtained. Dr. Gilliland, who served as a major in the veterinary corps during the war, organized and directed the veterinary laboratory service. The main laboratory was established at Philadelphia, and a veterinary section was organized in each of the medical department laboraties at Fort McPherson, Ga.; Fort Sam Houston, Texas; Fort Leavenworth, Kans., and the Letterman General Hospital, San Francisco, Calif., respectively. Through the co-operation of Col. F. F. Russell, M. C., the medical department laboratories were made available for the veterinary service and his advice and assistance was of the greatest aid when the veterinary laboratories were first organized. The veterinary corps was able to secure specialists to conduct this service during the war. Captain Robert Graham, who was in charge at Fort McPherson, Ga., is the animal pathologist of the University of Illinois, and Captain Hadleigh Marsh, in charge at Fort Sam Houston, Texas, is the state bacteriologist of Montana. The development standardization of intradermic mallein and the adoption for official army use of the intradermic mallein test for glanders is considered an important achievement in connection with our animal service. Major Gilliland and his co-workers conducted a very complete series of experiments along this line. They tested several thousand animals under all conditions. Accurate observations as to the results were obtained, laboratory examinations were made of material from a large number of clinical reactors and by these examinations they were able to corroborate the results of the field tests. Previous to this time the subcutaneous and ophthalmic mallein tests had been used, but they had never proven satisfactory. At the present time all the mallein used in the diagnosis of glanders for the entire army is made in the Philadelphia laboratory. From August, 1918, to February, 1919, 175,000 doses of intradermic mallein and 5,000 doses of ophthalmic mallein were made and distributed by this laboratory alone, besides the manufacture of autogenous vaccines. The opportunities that the laboratories offer for the diagnosis of contagious and undetermined equine diseases and the ability to carry on special research work along these lines are of inestimable value to the service. The development and standardization for army use of a laboratory method for the manufacture of dourine antigen used in the complement fixation test for dourine was also accomplished by this service. The serological work done to date includes over 5,000 complement fixation and 2,000 agglutination tests for glanders and over 1,500 complement fixation tests for dourine. This work alone shows the need for a completely organized laboratory service for this corps. The routine laboratory work consists of examining plus specimens and blood serum, skin scrapings and solid tissue specimens. Other important research work has also been conducted relative to determining the value of hyper-immune influenza serum in the treatment and prevention of equine influenza; the value of sodium cacodylate in the treatment of influenza; and experiments to determine the effect of intradermal mallein from the serum of animals injected with same when such serum was subjected to the complement fixation test for glanders."

POINTED OPINIONS ON LIVE TOPICS by Readers of Veterinary Medicine

"It is in reports like those of this department that the current history of the progress of veterinary science is written. Are you leaving a record of your experience which will help others, as you have been aided by these and other clinical reports? If not, you are earnestly invited to contribute from your experience that this department may be of the greatest service to its readers. By so doing you will earn the lasting gratitude of those who are aided by your suggestions.

Differential Diagnosis of Swine Diseases*

By A. T. KINSLEY, M. Sc., D. V. S., Kansas City, Mo.

THIS is an enormous subject, and as I look at it one that has no limitation. Therefore, I am going to simmer it down to the differential diagnosis of *some* of the infectious diseases of swine and in my humble way give as much light on it as I can, hoping to glean more on the subject from others here.

Hog Cholera

First and foremost, is hog cholera, a filtrable virus disease. This disease is still considered by many to be lesionless, so far as gross or macroscopic changes in the tissues are concerned. It is true that in cholera we usually find associated lesions, consisting of tumefied, congested or hemorrhagic lymph glands, hemorrhages beneath the serous and perhaps mucous membranes in various structures of the body, possibly hemorrhages in the kidneys and spleen, changes in the bone marrow and changes of the skin; but, as stated, these lesions are probably merely associated conditions. Probably they are not due to the filtrable virus at all, but are caused by other infections or conditions existing simultaneously with the cholera in swine.

Hemorrhagic Septicemia

Next is hemorrhagic septicemia, which in swine does not assume definite types or forms that it does in cattle and sheep. At least, the different definite types have not been identified and described in swine the same as we find them in the bovine or in the ovine. In swine there is the septicemic type of hemorrhagic septicemia, the pulmonary type and the intestinal type. Possibly there might also be distinguished a cerebral type.

The septicemic type of hemorrhagic septicemia is characterized in the majority of instances, purely by hemorrhages, for the animal does not live long enough for other lesions of any moment to be produced. The hemorrhages of this septicemic type are on the serous and frequently also on the mucous membranes. One investigator recently told me that the principal pathognomonic lesion of hemmorrhagic septicemia was petechial hemorrhage beneath the synovial membranes. We have seen these hemorrhoges in that location in other conditions, and I do not believe it to be pathognomonic of hemorrhagic septicemia. But the lesions stand out most prominently in the very acute form of the septicemic type of this disease. Then if the disease is a little more protracted because of an animal's greater resistance to it or because the virus is not so virulent, there will be lesions in the lymph glands.

In the pulmonary type of hemorrhagic septicemia or swine plague, there is, I believe, quite a distinctive factor. It is not the embolic pneumonia, which has been described as being caused by infestation with ascarids, but it is an atypical, catarrhal or bronchial pneumonia in which there is some interstitial exudation. The amount of exudate is rather limited in swine, because of the nature of the structure of the lungs in those animals. This form of the disease in cattle is quite distinctive. The interlobular spaces are separated always by exudate, sometimes the width of this separation being equal to that of my finger. But in swine this is less distinct because of the make-up of the lungs. In addition to this interstitial exudate, the atypical catarrhal pneumonia is similar to catarrhal pneumonia in other animals and consists of definite stages. The areas involved will show red hepatization, gray hepatization, brown, yellow or yellowish-white. If the animal has sufficient resistance and it is killed for the purpose of autopsy, this hepatization will be noticed, but if the hog dies as a result of this infection, there will be necrosis.

In addition to involvement of the lung tissues,

*Address at the meeting of the Ill. Vet. Med. Ass'n, Champaign, Ill., July 7, 1919.

in a considerable percentage of cases there is a pleurisy, fibrinous in character, in which the two layers of the pleura are adherent, making that condition which you have all observed where the lung adheres firmly to the thoracic cavity, a result of the fibrinous pleurisy. In others there is a secondary purulent pyogenic infection, and in place of the fibrinous type of pleurisy, the pleural cavity will be more or less filled with a purulent fluid usually relatively thin. The lymph glands, particularly those related to the lungs, will show involvement, the exact condition depending upon the duration of the disease. In the earlier stages there will be tumefaction of the bronchial and mediastinal lymph glands, and not infrequently a similar condition is found in other groups of lymph glands.

Frequently this pulmonary type of hemorrhagic septicemia is associated with the intestinal type or with the disease caused by the filtrable virus—hog cholera. It is my judgment that you will also find it as a sequel or associated with the lesions produced by ascarids in the lungs, more particularly in the larger animals rather than in suckling pigs.

Mixed Infection

The next disease I rather hesitate to mention. I do not know just what your position is in the matter of mixed infection. This is a bad term to apply as it might signify almost anything unless we define ourselves. Six months ago when I was privileged to visit the meeting of the Illinois association in Chicago, you were rampant, if you will permit the term, on mixed infection. A great many of you were apparently forgetting that there was such a thing as a filtrable virus and hog cholera, and I hesitate just a little to discuss this subject because I do not know your position now; but I know this, that you who made statements that hog cholera was a minor ailment will sooner or later change your minds, because hog cholera is an important infection. Relative to mixed infection, in the examination of many specimens, it has been found that a large percentage of them contain the bipolar organism. Why shouldn't they? The bipolar organism is practically universally distributed. But I have believed and I still believe that in the so-called mixed infection, the suisepticus or the hemorrhagic septicemia organism is the all-important one. I believe the animals are primarily infected with the intestinal form of hemorrhagic septicemia and the other organisms are associated because they are more or less natural inhabitants of the diseased tissues of swine. I have no figures with me, but eighty some odd percent of the so-called mixed infection in which we found the bipolar organism predominating, showed the intestinal type of hemorrhagic septicemia. It has been my privilege to have observed this condition in a neighboring state of yours to the east, in which hemorrhagic septicemia seemed to be the predominating form and attacked the bowels and especially the small intestine, resulting in diarrhea and death in the early spring pigs. In the animals that survive the acute attack, there will be other lesions that we associate with mixed infection. The usual striking characteristic lesion consists of a modified croupous inflammatory disturbance primarily surrounding the ileocecal valve and extending into the small intestine. There is an exudate, which, however, is not a true croupous exudate and in the majority of instances it can be removed without the destruction of the underlying tissue. This condition, I believe, has been designated by several investigators as necrotic enteritis. It is not necrobacillosis. This is a different proposition. It is an atypical croupous disturbance of the mucous membrane. Possibly in the most severe cases, it might become diphtheritic in character, but it will ultimately result in sloughing of the mucous membrane, so it can be termed necrotic enteritis. In that condition there is also found a tumefied spleen and frequently hemorrhages in the kidney. The hemorrhages in the kidney are very like those found in the filtrable virus disease and in some cases are larger and less distinctly circumscribed. These hemorrhages are probably the result of paratyphoid infection.

Other Diseases

I do not know that I need say anything about necrobacillosis as I believe all of you are familiar with and can distinguish that. I do not believe I have to mention tuberculosis. I do not mean to say it is not an important disease, but I believe the lesions of the disease can be identified by you all.

I should like to speak of another phase of the pig problem that as been ably described by Dr. Raffensperger. In sections of the country we have suffered a 30 percent loss of our 1919 pig crop and are really going to produce only about 70 percent of the pig crop that we generally produce. From investigation so far made, we find that about 15 percent of our pigs are dying from pulmonary ascarids or from the lesions described by Dr. Raffensperger. We lose 10 per cent of our pig crop from abortion and still birth. I hope we will be favored with a remedy for that condition by someone, We are losing 5 percent in a variety of conditions, most of the conditions, I think, being hemorrhagic septicemia.

DISCUSSION:

Dr. H. R. Schwarze: Dr. Kinsley covered the field so thoroughly in his brief way that I hardly know what to add to the subject. I shall confine my few remarks to the cerebral form of hemorrhagic septicemia. Dr. Kinsley said he thought perhaps there was such a type of the disease. I will mention a case that I was called to which is very interesting in con-

nection with that statement. Dr. Holmes of Springfield called me one Sunday morning and said a farmer about eight or ten miles out of the city had called him up and said he had a herd of about 90 pigs that were perfectly well on Saturday night and when he went out to feed them Sunday morning there were 40 or 50 sick and others not feeling well. He wanted me to go out with him and see what the trouble was. We went out, and I will have to admit that it was the strangest sight I ever saw in my life. Some pigs were pushing against fence posts and reeling as if they had been drunk for a week. The first thing that entered our minds was poisoning of some kind. We looked them over and inquired about feed, but there didn't seem to be anything that indicated poisoning. As we got to looking around, we ran across some old "rickets" that were alone and we recognized the chronic type of hemorrhagic septicemia. We came to the conclusion that the owner was not sure that the hogs had been well the night before. We did not make a positive diagnosis but took some of the pigs back to the laboratory to make further investigation. One died on the way back to the laboratory, and we made some inoculations and demonstrated hemorrhagic septicemia without any trouble. Some of the other pigs we let run a day or two, and apparently they got all right, and then they went crazy and frothed at the mouth. On the second day one of these mad animals died and I made an inoculation of the cerebral fluid and demonstrated the hemorrhagic septicemia organisms in that case, so I do not think there was any doubt that it was a case of hemorrhagic septicemia of the cerebral form.

As to mixed infection, I am glad to hear that Dr. Kinsley is of the opinion that mixed infection is rather a misnomer, that it is not properly applied. I feel a good deal like he does that the bipolar organism plays a very important part in these conditions that we call mixed infection and that it is primarily the important factor in this disease. One thing in experimental work is very interesting to me, and that is that an animal infected with hemorrhagic septicemia in what one might call the last stages when it is gradually dying, will start to putrefy probably 12 to 24 hours before it dies, and one can smell it. They smell just as rotten as any dead hog. On posting these animals, you will find a spore-forming organism, a gas producer. The liver will be full of gas bubbles, and probably in an hour or so the pig is bloated up and gas issuing out of different parts of the body.

E. A. Cahill: I cannot resist the temptation to quote one item. I recall having heard several years ago that the mills of the gods grind slowly but they grind exceedingly small. It has been my pleasure during the last few years to take part in several of these discussions. In one of these I tried to show laboriously what I have heard Dr. Kinsley say today, and when I closed my paper, he said the subject was as clear as mud. There have been more discussions on this subject at different meetings than on any other subject. It has been my good fortune to hear or take part in most of them, and I want to tell you gentlemen who haven't had that privilege that I haven't heard in such a brief time a subject so thoroughly presented as Dr. Kinsley has done today. He told us he was limited in his time, but it remains for anyone to give a clearer picture of hemorrhagic septicemia than Dr. Kinsley has done today. As may be expected, we do not always agree. I think the knowledge of diseases is in an incubative stage and we are learning something about them all the time. I think all of us will agree with Dr. Kinsley in the main, but there are a few things that I do not want to bring out in controversy but I wish to bring out to clear the matter up. First, regarding the lymph glands. We have never been able to observe the lymph glands affected as Dr. Kinsley described in what he thought was hemorrhagic septicemia. I have always felt that there is no difference between the lymph glands in hemorrhagic septicemia and in some other diseases. We have not been able to observe the petechial, mottled form of lymph glands. We do get an enlargement possibly of the submaxillary and sublingual glands but practically never in the mesentery glands. I mention this as one point wherein our experience has differed from that of Dr. Kinsley. I also differ from Dr. Kinsley on the so-called mixed infection and not so much on mixed infection as the intestinal form of hemorrhagic septicemia. I think we are in accord on mixed infection. At one of the meetings, I remember the previous speaker presented a paper which some said was a disappointment. In my opinion the paper was a good one although it did not live up to its title. I remember many of your members expressed disappointment because he would not call this condition mixed infection. I have noticed today that there is a decided change of opinion. In other words, the original primary invader of either the intestinal or pectoral form is the suisepticus and the original condition is hemorrhagic septicemia. What infection after it progresses a while is not mixed infection? You do not call tuberculosis a mixed infection, but give it a little time and you can find almost anything. We do not call it mixed infection, however, but say that a secondary infection has arisen. We have the same condition with this disease. If the B. suisepticus is the primary invader, the question is where does the secondary infection come in. Dr. Kinsley said even in the intestinal form of hemorrhagic septicemia the B. suisepticus was present in some 80 per cent of cases. In

this his work agrees with most of the men in this line. Dr. Kinsley said that the intestinal form was primary and that the pectoral form was secondary. Through Illinois, Ohio and Indiana, farther south and farther east, the condition has not been of that description. The original primary invader has been the suisepticus and almost immediately following that was not an enteritis but a lung condition described by Dr. Kinsley. It became of so much importance for some of us to be certain of this fact that we attempted to prove to our satisfaction that this was or was not the case. I do not come prepared with actual statistics, but we carried on a long series of experiments to determine whether or not as described by Dr. Kinsley and others the intestinal form was primary and the pectoral form secondary. A large number of pigs were inoculated with B. suisepticus. A number of you may say and textbooks may say that you can with difficulty reproduce hemorrhagic septicemia in swine. It is not difficult to reproduce hemorrhagic septicemia in swine. If pure cultures of the B. suiscepticus are isolated from outbreaks, it is not a difficult thing to reproduce hemorrhagic septicemia, and it does not take, as the textbooks say, 150 to 250 cc. of this suspension. It may be done with 10 cc. intravenously and with a smaller amount subcutaneously. These pigs were inoculated with a large number of the organisms to make sure of their getting hemorrhagic septicemia. They were thumping and thumping severely. They had been under observation for at least two weeks. Within two hours the temperature of these animals in the test was normal, while the temperature of the animals in other cases was usually elevated, so the temperature was of little significance, but the thumping was of consequence. It was found without a single exception in this series of experiments that the intestinal form was not the primary condition. The first thing it showed, if the animal lived to show anything and most of them do not, but if they did live sufficiently long, a catarrhal condition of the lung followed by edema and progressing through the hepatizations that have been described. The most important thing in the series of experiments other than the fact that we can reproduce the disease, was that when an enteritis developed, it appeared from three to nine days after the inoculation. I believe there was just one exception where B. suisepticus was recovered from the blood. Usually after 6 to 8 days an enteritis developed. I do not know whether it is an intestinal form of the infection or whether it is a mixed infection, for surely there is some other organism concerned. However, I think it is the intestinal form of hemorrhagic septicemia.

Dr. Roberts: Dr. Cahill has referred to the lung form of hemorrhagic septicemia as we see it in Indiana. The intestinal form we have seen quite a little of all over the state, especially in small pigs. I know of one farmer in particular that lost quite a number of pigs last year and is losing a large number this year. Letters are coming to the laboratory quite frequently from all over the country asking as to when one should treat for hemorrhagic septicemia and when for hog cholera. We received a letter recently from a lady in the southern part of the state who said she had her pigs vaccinated seven times. She had 17 to begin with and now had one. It seems that the whole country is stampeding toward hemorrhagic septicemia and forgetting that there is such a thing as hog cholera. Just a short time ago, I was on a farm where they had received 350 hogs from Arkansas and something like 200 from Kentucky. One bunch had been vaccinated with a serum of which they knew the manufacturer, and the other they did not know anything about. The owner said that out of the bunch from Kentucky he had been losing one every seven or eight days. Of the 350 from Arkansas, he had lost over fifty. In the herd that came from Kentucky, on post mortem examination, I called the disease hemorrhagic septicemia. The very large loss in the other herd proved as we have been told that hog cholera is a herd disease while hemorrhagic septicemia is more of an individual trouble. In the herd from Arkansas I found hemorrhagic lesions, the lung lesions spoken of by Dr. Kinsley, typical circumscribed pneumonic areas with pleuritic adhesions and pleural exudate, but beyond that I found what we have always been taught, small pin-point or pencil-point hemorrhages that I was satisfied had something to do with hog-cholera, and the owner asked me what he should do. I told him it would be impossible for me to interest him in the least, believed I could not tell him what he should do; in fact, said I did not think he would listen. I advised him to get serum and revaccinate these hogs. He did it 48 hours afterwards. I received a letter from him a few days ago saying he was satisfied with the treatment. It looks to me that where we are unable to get laboratory assistance to diagnose the disease definitely when we are in doubt, we should eliminate hog cholera for sure. Even if the hogs have been vaccinated, revaccinate to eliminate hog cholera and then treat for some secondary trouble if there is any.

Dr. Graham: I would like to emphasize just what Dr. Roberts has told us. We feel from the letters that are written to us by stockmen requesting methods of procedure, that it is quite safe to eliminate hog cholera. This was especially brought to our attention last month. A breeder of pure-bred hogs had a type of infection in his herd which was difficult to diagnose. During an interim of two and a half weeks, a diagnosis was being made, a very conservative

procedure, and at the end of that time it appeared that it was hog cholera and the hogs were treated for that. Meanwhile the loss sustained by this particular breeder was approximately $10,000. I believe from that one experience alone I have learned when in doubt to use serum. I feel sometimes the veterinarians withhold that advice in order to reduce the expense to the owner. I think it is false economy. I believe hog cholera should be eliminated first and then these secondary diseases taken up. When making a diagnosis of hemorrhagic septicemia, identifying the organism in smears and injecting it into rabbits, that disease may undoubtedly be indicated, but we have also encountered a filtrable virus to contend with. The simple fact that we have hemorrhagic septicemia indicates to me that we cannot afford not to eliminate hog cholera, and we should be very careful to eliminate this disease.

Dr. Kinsley: I am very much obliged to Dr. Schwarze for his discussion of the cerebral type of hemorrhagic septicemia. His description, I think, would be splendid for us all to remember. I certainly appreciated Dr. Cahill's remarks relative to the experiments they have been making, and I am especially indebted to him regarding the lymph glands. However, I must have overstepped myself or Dr. Cahill did not understand me. My remark was that in the so-called mixed infection I believed the animals were primarily infected with the intestinal form of hemorrhagic septicemia and the other organisms are associated. I did not mean to infer that the enteric form was primary to the pulmonary type of hemorrhagic septicemia. Concerning Dr. Roberts remarks, I am going to take issue with him on one problem and that is the retreatment of hogs that have been *known* to be properly treated with serum and virus. I believe revaccination in such cases is practically worthless. If you have no history of the case, *then* you must eliminate hog cholera, and I made the remark that in my judgment the filtrable virus was the disease you must recognize and get rid of. It is the important disease of swine. But in spite of the demonstration of the filtrable virus, that does not prove that hemorrhagic septicemia is not an important disease. In a known case where proper serum has been administered, retreatment is an entirely worthless expense to the producer without bringing any beneficial results.

D. O. Thomson, Pres. Ill. Agri. Assn.: When the doctors disagree, what are we going to do? I should like to know whether we should revaccinate or whether we should not revaccinate. It piles up the expense on the hog producer by revaccinating and I wonder if the speakers are so far apart in their opinions as they seem. As a representative of the hog producers, I should like to know so I wouldn't be so much in the air as I am.

Dr. Cahill: It seems to simmer down to a question of diagnosis. There are mighty few cases where a practicing veterinarian can go into the field, post a pig and feel sure of his diagnosis. I believe it is the consensus of opinion as expressed in discussions at different meetings that if a man is going to make a correct diagnosis he must do it very slowly. I believe he can do more by a cross-examination of the owner. There are certain differences between hog cholera and hemorrhagic septicemia that while not constant are of vital importance in helping a man to arrive at a diagnosis. For instance, it is very rare except in hog cholera to see the typical knuckling of the hock of the hog. You can't get that typical knuckling of the hock in pigs inoculated with B. suisepticus. On autopsy in hemorrhagic septicemia, I do not believe you get the typical petechia that you do in hog cholera. In differentiating between hemorrhagic septicemia and hog cholera, the absence of the typical hog cholera petechia on the ileocecal valve is one of the most important things and the study of the history and symptoms is the most important.

Dr. Mills: As a practitioner I have been much interested in the discussion, but there are some points that have been brought out that still leave us with our good friend here from the Illinois Agricultural Association decidedly on the fence. I think we are still considerably in doubt and will be for some time as to the real differential diagnosis in a herd as we meet it in the field. I can see how they can take their laboratory findings and demonstrate these diseases as has been brought out by the speakers; but when we take the conditions in a very insanitary pen and try to help the farmer out of his trouble, we are likely to be blamed by the men that Mr. Thompson represents because we cannot save the hogs. It might be well for us to make it plain to these people that with the best investigation it is *sometimes* impossible to

The amputation of this cow's hind leg was performed about the middle of April when the cow was still carrying her calf. The calf sold for $30.00 and the cow is now nursing another. What would it mean nowadays if she were a pure-bred?
Angola, Ind. H. E. BRYAN.

prove the difference between hemorrhagic septicemia and hog cholera. A practitioner does not carry a microscope nor operate a laboratory. The veterinarian is misjudged by the farmer or hog producer because of the fact that these diseases are so hard to diagnose.

HEMORRHAGIC SEPTICEMIA BACTERINS FOR FOWL CHOLERA

It is quite general in parts of Iowa on farms where hemorrhagic septicemia of hogs has been rampant for the women folks to make an appeal to the inspector regarding severe losses among the poultry. Some chickens in good condition drop dead from the roost and others go into a decline, exhibiting diarrhea, lameness, anemia, extreme loss in weight, etc.

In one such case the lady was very much concerned and was advised that the history and symptoms indicated fowl cholera and that many veterinarians were using a fowl hemorrhagic septicemia bacterin for the malady with very satisfactory results. It was recommended that a veterinarian be consulted and a trial of the vaccine instituted.

The veterinarian consulted happened to be a graduate of many years of experience. Instead of grasping the opportunity for progress, he said that vaccination was "tommyrot" and sold an amount of potassium permanganate tablets. A poultry remedy that this woman had been using purchased from a stock food peddler also contained potassium permanganate. It had been used persistently for five months. Finding the veterinarian's tablets were seemingly the same at a higher price and gave only the same temporary relief afforded by the cheaper remedy, one can imagine what satisfaction was engendered by that service.

On the other hand, successful vaccination of this flock would have brought many neighbors and family connections to the veterinarian's door to develop a side of the business he has never enjoyed. Pleasing the women folks would have cinched the entire veterinary work from the men, and he could have had the satisfaction of having rendered valuable service.

M. B. G.

MALIGNANT GROWTHS IN A DOG

I recently had a very interesting dog case here at the Royal Veterinary College. A bitch was brought into the out-patients clinic with a history of vomiting, constipation and of having swallowed a stone, which the owner said she was quite in the habit of doing. The bitch was very weak and the abdominal walls were tense and tender to pressure; temperature 103° F.; pulse weak and rapid. The tenseness of the abdominal walls prevented any attempt at palpation so diagnosis was withheld, and I was told to do an exploratory laparotomy.

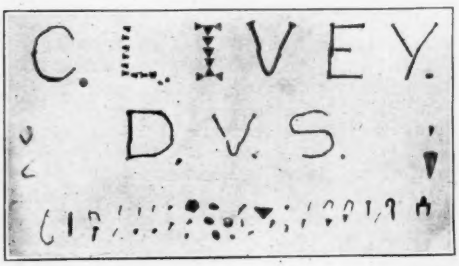
On opening the abdomen, I was met with a fairly copious hemorrhage which was rather disconcerting, but on examination the spleen was found to be ruptured and tremendously enlarged and studded with neoplasms. The spleen was removed after ligating the vessels and the exploration carried farther. The mesentery of the small intestine was loaded with new growths and about three inches of the ileum surrounded with and occluded by neoplasms. As the condition was quite hopeless, the chloroform was pushed and the patient allowed to sleep out of existence.

On postmortem examination, new growths were found in the kidneys, prepectoral lymphatic glands and the mediastinal glands. The liver was also invaded. It is remarkable that with this extensive invasion, symptoms were so long delayed, and it also shows how little one can depend on what the owner of the animal tells one. In this case there was nothing in the stomach, much less a stone; the intestines were also empty. I think the spleen was ruptured when the animal was put on the table as otherwise she would have shown symptoms of internal hemorrhage. Cases of malignant new growths appear to be common in dogs in this country as we have had several since I have been at the college.

London, England. C. G. SAUNDERS.

FOREIGN BODIES IN RUMEN OF COW

On the night of May 16th, I was called to see a Jersey cow. It was down but got up in a few minutes, walked around, pawed a few times and lay down again. On examination I found a large abscess just posterior to the left shoulder. I told the owner that this was causing the trouble and was probably due to some foreign body in the stomach. I gave a drench and left one to be given two hours later. I called the next morning and opened the abscess. About one liter of a dirty liquid pus escaped and was of a very foul odor. I cleansed the cavity with lysol solution and left instructions for the owner to report.



On June 18th he telephoned and said the cow had not eaten anything since the 16th. When I arrived this time, she was dead. Autopsy revealed several gallons of a serous fluid in the peritoneal and thoracic cavities. The lungs had a few small abscesses and the pericardium was filled with a very thick yellow pus. The liver had

well marked necrotic areas of which several contained pus. The gall bladder was enlarged and the contents gelatinous in consistency. The spleen showed lesions similar to those found in the liver but they were more extensive.

The articles found in the rumen are shown in the accompanying picture, as follows: In the letters and periods are 24 assorted nails, 4 pieces of baling wire, 1 screw, 9 brads, 9 glazier points and 6 shot. There are 43 others such as glass, tacks, stones, small nails, a fish hook, sinker, two pieces of crockery ware, etc., making a total of 96.

Diagnosis: traumatic pericarditis.

San Marcos, Texas. CURTIS L. IVEY.

TREMBLES OR MILK SICKNESS

In the July issue I notice articles on trembles or milk sickness, in which the cause is attributed to snakeroot. While practicing in Illinios, I had considerable experience with the trouble. The conclusion I came to was that snakeroot had no connection with the affection but that it was due entirely to a poison (vegetable) on all the plants growing in the woods. The sun never shines on the soil there and it is a damp soil. I found it causes an acute nephritis. The only treatment that I found and believe effectual is purgatives.

Glenwood, Ia. B. F. WARD.

RED DIARRHEA OF BOVINES (INTESTINAL COCCIDIOSIS IN VENETIA) *

M. Cremon who is assistant at the clinic of the Veterinary College of Turin, reports that bovine coccidiosis is more frequent in Italy than is generally known. He has had opportunities to study it clinically and to be able to diagnose it microscopically. Coccidium bovis develops more particularly in animals of twelve to eighteen months old pastured on the low marshes of Venetia. He has however noted it also in one animal of five years and in another of only six months.

In some cases the course of the disease is extremely rapid and death may occur in four or five days, which is preceded by a rapid emaciation, attacks of convulsions and the continuous passage of blood clots.

The treatment recommended by San Lorenzo, mainly, thymol in doses of 10 to 15 grams, gave some cures in four to five days. L. J. K.

*From "Il nuevo Ercolam."

Officers and members of the Ontario Veterinary Association in attendance at a meeting in Toronto.

THE VETERINARIAN'S WIFE AS A FACTOR IN A SUCCESSFUL VETERINARY PRACTICE*

The homes of the veterinary profession must have the same essentials as the foundation of all homes, which should be a copartnership. The old statement that man is the architect of his own fortune may be true; nevertheless, many times the wife is the designer, contractor, the decorator and his able assistant. In building a home the veterinarian's wife must be a helper in building up the husband's profession as well, because on his professional success her living depends, and, our inspiration in any line usually depends on the interest we take in it. When I married my husband I married his profession, too—I took them both for better or for worse; I can truthfully say that the profession at least has been for better.

In speaking of the wife as a factor in a successful veterinary practice, I would have you remember I am speaking from the viewpoint of the wife of a country practitioner, because I do not think in a city practice, the wife has more than a very limited acquaintance with her husband's patrons.

In the first place I think a wife can give dignity to the profession in many ways, one of which is in speaking of the members of the profession as *veterinarians*—do not say *veterinarys*, and right here let me say I hope there are no wives who say veterinarians, as if it were spelled v-e-t-r-i-n-a-r-i-a-n.

Not long ago Dr. Welch received a whole package of labels printed by our local editor with the word veterinarian misspelled. I rebelled at the idea of using them at all. I considered it a reflection on the profession to send out labels with the word veterinarian misspelled.

Some 25 years ago when a young man whom many of you know, was considering entering a veterinary college, his mother, in speaking to an elderly lady about this son wanting to go to study to be a veterinarian, jokingly said she didn't want her son to be a horse doctor. The elderly woman to whom she was speaking replied, "Well, I am sure I don't know which would be better for him to be a horse doctor or a veterinarian." Evidently she had not heard of a veterinarian at that time and considered it a profession vastly different from being a horse doctor. I am glad to say that today there is a difference and that most of the practitioners eligible to membership in the Illinois association are veterinarians and not just horse doctors and should always be spoken of as such.

In our line of work it is of vital importance that we be interested in people for sincerity is the first true essential to the exercise of personal influence with patrons, and I am sure the average country practitioner's wife as telephone girl and book-keeper, deals with the patrons almost as much as the doctor himself does. From a professional standpoint it pays to know people and to be interested in them. With my inquiring turn of mind I do not find this difficult. It is so easy, for instance, when a patron who is a cattle dealer, calls at the door or on the 'phone and either by the expression on his face or by the tone of his voice, manifests his impatience because the doctor can't get out to his farm for two or three hours, for us to quickly remark, "We were so glad to hear you topped the market with the load of cattle you shipped Sunday night," or "How are the bunch of hogs doing that you had treated?" or if you know he still has his last year's corn crop, to comment that corn is still going higher, or some other remark that is apropos and see how quickly the trend of his thoughts change. Then to cut the conversation short, quickly remark, "Now I'll locate the doctor by phone and get him out there just as quickly as possible," and your patron who at first thought he just could not wait two hours for the doctor says, "All right, tell him to come on out just as soon as he can."

There is such a difference in the way we answer our patrons' calls on the phone. When a patron calls and the doctor is already several miles out in the country and he can just as well make the call on his way home, tell your patron, "Yes, the doctor will be out there in a half or three-quarters of an hour," and then phone the doctor to make the call on his way home. Don't tell your client, "Yes, the doctor is at such and such a place and you can phone him there and he will stop at your farm on the way home." If you want a thing well done, do it yourself.

I have found it best when a client calls to find out who it is and what they want, instead of first saying, "No, doctor isn't here, he is out east ten miles on a colic case." Many a call is lost by just such a reply when the reply might just as well have been, "I think I can get him on the phone, I'll let you know just in a few minutes."

Every veterinarian's wife who has to take care of any of the telephone work should learn to be able to diagnose ordinary cases over the phone, not only so that she can tell the doctor what kind of a case he is called to attend and thus he may go prepared, but in some cases she may render valuable advice to the patron while he is waiting for the doctor to arrive. Especially is this true in cases of overheat or azoturia or milk fever.

There may be those here who have heard me repeatedly declare, when in one of those characteristic pessimistic moods of mine that success depends about one-third on capability and two-thirds on affability, but after all I guess—

The father of success is work,

*Presented at the Ill. Vet. Med. Ass'n. meeting, Champaign, Ill., July 7, 1919.

The mother of success is ambition,
The oldest son is common sense.
Some of the other boys are perseverance, honesty, thoroughness, foresight, enthusiasm and cooperation.
The oldest daughter is character.
Some of her sisters are cheerfulness, loyalty, courtesy, economy, sincerity, and harmony.
Get acquainted with the father of this success family—
Work—and you will be able to get along pretty well with all the rest of the family.

Every housewife is urged nowadays to keep an emergency shelf well stocked for the unexpected guest, but we, as veterinarian's wives, should keep this shelf well filled for one more reason than the welfare of the unexpected guest and that is that we may be prepared for the hurried meal that must come, O, so often, with these urgent country calls, for I have often wondered why it is that the average farmer seems much more excited and anxious for the veterinarian to hurry than if some of his family were ill and he were calling the M. D.

Then too, after a night or two with but little chance to sleep followed by a strenuous day's work, the husband comes home, almost too tired to eat, at least too tired to digest a heavy meal, with some such comments as "I sure don't want to hear that telephone tonight" or "It will have to be a mighty good friend that I would make a country trip for tonight for I must have some sleep," don't let us make the mistake of spoiling the chance of that much needed sleep by serving a very heavy evening meal. Rather let it be a bread and milk supper or hot milk toast or on a cold winter's evening, a good hot soup. But some wives will say, "What would you do if your husband objects to such an evening meal when he says he is as hungry as a wolf?" Well, I don't know just what I would do. I suspect I might, the next time, cook him a big dish of greasy fried potatoes, bacon fried to a crackling, boiled cabbage, soggy biscuit, and serve mince pie for dessert, and thus prove to him the lighter diet was what he really needed.

One of the greatest helps in making the wife a strong factor in the success of the profession is by attending these meetings. This getting together of the ladies at *our* state meeting—please notice I said our meeting, is going to prove a great benefit, not only to ourselves, but to the profession. I almost said, create a revival of interest in the work, but I do not feel there has been any interest lost. It is only the beginning of a united interest.

Why, only a few years ago, not more than twelve, I think, I attended a midsummer meeting at Springfield with Dr. Welch and found myself the only wife in attendance, although I'll admit I had really expected but one other wife there. Nevertheless, I spent a very pleasant day meeting my husband's friends at the noon hour and spending the rest of the day alone seeing Springfield, and was glad I had gone even though I may have been conspicuous by being the only wife at the meeting.

I have really heard some doctors say "I go to these meetings to visit, it is like a reunion and I have no time to spend taking my family around." I have never noticed any doctor's time at the meeting being encroached upon by his better seven-eighths, unless it was when he was trying to find her to introduce her to some special friends, or to know whether they could accept an invitation to dine with some former classmate he had just met.

I become so over-enthusiastic perhaps when I think of what a strong factor the average veterinarian's wife can be and should be in the profession, that I wonder if the time is not near at hand when a ladies' auxiliary would be an inspiration to the ladies and thus indirectly prove a benefit to the state association, through which an interest in the profession will be awakened and knowledge acquired that cannot or will not be attempted by the individual. I think most of the ladies will agree with me that we go home from these meetings greatly benefited, for "misery loves company." We have found out that other wives are keeping office, posting books, waiting meals, etc., very much the same as we are.

This is certainly a full program for a first session. I wonder if our most excellent secretary realized what it meant to give the floor over to a half dozen of the ladies this forenoon? Well, it goes with the profession to hustle or, rather with us wives who keep office to try to keep the head of the house hustling. I lately heard a story of a man who fell into the Chicago river. I believe they used to say fell *on* the river but of later years since the ditch has been dug, he falls in the river. A man saw him struggling and heard him crying for help and ran towards the river a moment long enough to say "What is your name and where do you work?" The man answered, "My name is McShane and I work in the shop up there." The other man did not stop to pull the drowning man out but ran up to the shop and said, "I want the job of a man named McShane who is drowned." The secretary answered quickly "You are too late, we gave the job to the man who pushed him in."

I have been sort of pushed in here this morning and several other ladies will soon have my job and you are going to hear some really good ideas along this line.

Perhaps the best thought I can leave with you as to how the wife can be a strong factor in a successful veterinary practice is this:

"To do the best I can from morn till night,
To pray for added strength with coming light,
With some left over for a rainy day;

To do distasteful things with happy face.
To smile instead of frown at fate,
Which placed me in a family always late, to meals,
To do the sewing, mending, and the thousand
Things always near at hand,
And do them always with a cheerful heart,
Because in life they seem to be my part."

Lexington, Ill. MRS. W. H. WELCH.

PURPURA HEMORRHAGICA, A PRIMARY AFFECTION

The majority of cases of purpura are, as a rule, a sequel to diseases such as strangles and pneumonia. On April 26, 1919, a common cart stallion was reported as being or seeming to be quite all right when put to work in the subsoil plough in the morning. About 1:00 p. m. the man who worked him reported him as sick, that is, his legs were somewhat swollen and he was off feed. The owner phoned me and said the horse might be strained and I could give him advice over the telephone. I might mention that the estates contract with me for veterinary services at a certain amount per quarter. If I am needed every day, I have to go and get no more, while on the other hand, if I don't get called out for a year, I get paid just the same. To avoid having me go out when unnecessary they describe symptoms when calling up, and it is left to me to call if I think it necessary or to prescribe over the phone.

I thought it was a simple case of edema due to debility, so told him to give one ounce of turpentine and twelve ounces of linseed oil (the horses here are of the type of mustangs) and to let me know in the morning how the animal was, when I would prescribe an iron tonic. Accordingly he rang up and said the swellings were about the same but the appetite had improved. On the 28th I visited the horse. He showed the following symptoms: shivering, temperature 106° F., pulse 50 and weak, all four legs swollen, nostrils and eyelids slightly swollen. No petechial spots were observed, but the mucous membranes had a peculiar dirty color.

The following was prescribed to be given every two hours until the shivering stopped:

℞

Spts. vini rectificati ..... ℥ii
Aqua ..... ℥xii

Following this he was to be given:

℞

Potassii Iodidi ..... ℥vi
Aquae ..... ℥xxiv

Ft. Sol.

Sig. Two ounces to be given 3 times a day.

I had to go to an adjacent island to perform a few operations and did not see the case until May 1st. He then was a most loathsome looking animal. The skin on the legs had sloughed, also that of the scrotum and muzzle. The inferior part of the abdomen from the sternum to the pubis was enormously swollen. Several experienced horsemen who had seen the animal told the owner to shoot him as he was good as dead.

I prescribed the following:

℞

Liq. ferri perchlor. ..... ℥iii
Ol. terebinth. ..... ℥vi
Pot. carb. ..... ℥iv
Ol. gossypii ..... ℥x
Aquae ad. ..... ℥xxiv

M.

Sig. Give 4 ounces in 12 ounces of water 3 times daily.

The sores on the body were bathed three times daily with the following:

℞

Aluminii sulph. ..... ℥i
Aquae ..... ℥xxiv

Ft. Sol.

On May 4th the animal was much improved. The swellings had reduced, the temperature was normal and the appetite ravenous. The mixture was repeated but instead of six ounces of turpentine only three ounces were prescribed. The animal recovered rapidly and the sores healed in another fortnight.

The peculiar part of the case is this. I advised giving the horse a month's rest after the sores had healed before putting him to work;

These illustrations are of a cow, seven years old, with a well developed case of tetanus. No abrasions or sores could be found externally. The owner said she had calved just two weeks before and the next day he tore the placenta away and caused considerable hemorrhage. There was some discharge from the vagina. The cow died in five days. F. M. Kearns, Lebanon, Ky.

during that time the right hock had become enlarged and very painful, and the animal suffered lancinating pain. I prescribed an anodyne lotion as follows:

℞

Plumbi acetatis	℥i
Flext belladonae	℥ss
Tr. arnicae	
Tr. camphorae āā	℥i
Aquae ad.	℥xxiv

M.

Sig. To be applied 3 times a day after fomenting with warm water for ½ hour at a time.

This was a case of acute arthritis, and the sequel of it is a well defined exostosis, or in other words, a spavin. A cantharides and biniodid of mercury blister was applied, and the animal is walking a trifle better; but sure enough, a spavin is there and the horse will likely remain permanently lame. I have never read or heard of arthritis following purpura.

Basseterre, St. Kitts, B. W. I. ERNEST F. JARDINE, Govt. Vt. Surgeon.

WHEN IS A VETERINARIAN NOT A VETERINARIAN

A large, three-year-old draft gelding was exhibited at a fair at Burgettstown, Pa., last October and won first prize in his class. He sickened with purpura hemorrhagica shortly after returning home. The owners called a veterinarian from Steubenville, Ohio, 16 miles away, and he prescribed for the sick colt and charged $5.00 for his services, but the colt did not improve in condition. Then a veterinarian was called from Pittsburgh, Pa., 25 miles away, and he prescribed for the sick colt and charged $25.00 for his services. The owners considered this exorbitant, but the veterinarian claimed he was the leading man in his home town and maintained a large hospital, which was handling the truth recklessly. However, his fee was paid in full.

The colt finally died, and as he had been insured, a mortuary certificate was filed with the livestock insurance company, who invalidated the policy, claiming contributory negligence on the part of the owners in failing to comply with a special clause in the policy requiring owners to call a qualified and licensed veterinarian when the colt was first noticed to be sick.

The veterinarian first called had practiced many years and made numerous professional visits into Pennsylvania but was a non-graduate and never licensed in any place or at any time; hence, a violator of laws. The owners lost the colt, insurance policy and premiums already paid as well as $30.00 professional fees paid. I presume this veterinarian would yet be amenable to the Pennsylvania state veterinary laws and also to suit by the owners of the colt. It is a rare case indeed and should point a moral. [Why has Ohio permitted this continuous violation of her veterinary practice act for many years?]

A new or annual reissue of state licenses is required by law in Pennsylvania, and I am wondering what would be the legal status of cattle owners whose livestock was condemned by state livestock inspectors who had not taken out state licenses for several years, a paradoxical condition in the light of the law. There are conditions where a veterinarian is not a veterinarian without the proper license. The state secretary has his trials prodding the annual license dodgers in Pennsylvania.

Pittsburgh, Pa. JAMES A. WAUGH.

ILLINOIS VETERINARIANS EXCEL MEETING RECORDS

The summer meeting of the Illinois Veterinary Medical Association, held at Champaign, Illinois, July 7th and 8th, was characterized by a good attendance, a fine program and excellent weather. The opening address was delivered by President Kinley, of the University of Illinois, who told of the aims of the university in serving the people of the state, and welcomed the association members and visitors, saying the only reason he could not give them the key to the gates of the university was because there were no gates, but they were invited to go wherever they pleased and ask all the questions they wanted to. Dr. Campbell, secretary of the association, made a brief response, in which he regretted that owing to the fact that Colonel Merillat had not yet returned from France he was unable to reply to the address as scheduled on the program, and thanked the dean on behalf of the association for his cordial welcome.

Dr. W. J. Martin, chairman of the committee on legislation, reported on the recent legislative activities of the association. Dr. A. T. Peters, of the committee on veterinary education, reviewed the progress made toward the establishment of a veterinary college at the University of Illinois. The legislature at the session just ended authorized and instructed the trustees of the university to establish a veterinary college, but withheld appropriations therefor until the university can present an acceptable plan for its organization and a budget showing the funds necessary for buildings, equipment and maintenance. It was announced that the faculty desires the co-operation of the state veterinary association and the state breeders' association in formulating this plan. The secretary's report showed among other activities that on its initiation 67 alleged illegal practitioners had been prosecuted. 40 convictions were obtained, 7 were discharged and 20 cases are pending. Four licensed practitioners (all graduates) had been tried for malpractice. Dr. N. S. Mayo, chairman of the committee on resolutions, reported as follows:

"A few short months ago it was our duty to pay a tribute to a number of our members who had crossed the misty river into the Great Beyond. Today, with bowed heads and heavy hearts we are called to pay the same tribute to others who have been active and beloved leaders in our organization and in all work for the advancement of our profession, and the good of humanity.

"Lieut. H. O. Weilupp died at Nice, France, December 7, 1918. Dr. H. A. Greer died at Danville, December 27, 1918. Dr. F. H. Anderson died at Evanston, January 15, 1919. Dr. J. T. Nattress, Delavan, died March 19, 1919, and Dr. Charles A. Pierce, of Elgin, died May 22, 1919.

"They have fought the fight and kept faith. We must take up the burdens and responsibilities that have fallen from their hands and carry them forward with renewed vigor. So that when we lay our burdens down, we can say:

"I do not fear to tread the path that those I love long since have trod;
I do not fear to pass the gates and stand before the living God.
In this world's fight, I've done my part; if God be God, He knows it well,
He will not turn his back on me and send me down to blackest hell
Because I have not prayed aloud and shouted in the market place,
'Tis what we do, not what we say, that makes us worthy of His Grace."

"Be it resolved by the Illinois Veterinary Medical Association that we extend our sincere sympathy to the sorrowing families of our late members, and that a copy of these resolutions be sent to each family, and also be spread upon the records of the association."

The ladies' contribution to the program on the subject of the veterinarian's wife as a factor in a successful veterinary practice, consisting of papers by Mrs. W. H. Welch, Mrs. F. J. Pilon, Miss Gertrude Nattress and Mrs. I. C. Brenner, was a most interesting feature and elicited much applause from the audience. One of these papers appears elsewhere in this issue.

Professor Mumford, of the university, talked on what the livestock breeder expects of the veterinarian, and among other things stated he believed the time was not far off when farmers would have some sort of periodic veterinary inspection of their farms and livestock, having the veterinarian call every week or ten days or two weeks or once a month and make a thorough inspection of the stock to see if anything was wrong and give the right sort of advice. It was his opinion that that would do more good than the present system of simply having the veterinarian come when an animal is about ready to die. For this work the veterinarian would be paid a salary the same as the county agent receives for advice on other matters.

Mr. D. O. Thompson, secretary of the Illinois Agricultural Association, presented an able discussion on the breeder's attitude toward the veterinarian. He asked for co-operation between the veterinary and agricultural associations. He invited veterinarians to refer to the agricultural association any differences arising between them and county advisers and the association would see that the difficulty was straightened out. He emphasized the point that his association was with the veterinarian in trying to get rid of patent "cure-alls" being sold to farmers for diseases of livestock. He also stated that the two associations could work together in getting an adequate appropriation for the establishment of a veterinary college at the university.

Dr. A. T. Kinsley gave a brief but admirable talk on the differential diagnosis of swine diseases, which was ably discussed by Drs. Schwarze, Cahill, Glover and Roberts. This paper and discussions appear elsewhere in this issue.

Dr. H. B. Raffensperger, of Chicago, discussed ascarid infestation in swine and had procured a number of young pigs so infested, which were autopsied, and the presence of the parasites in the lungs were demonstrated by microscopic examination.

A dinner was given at the Y Inn in the evening, during which Dr. J. I. Gibson, of Bloomington, Ill., entertained the guests with bass solos and Mr. I. C. Brenner, of Chicago, also sang a few ditties, one of which was "The Song of the Serum Men" with the following refrain:

With serum and with virus too,
We hit the tempting trail,
And swoop upon the anxious vet
Wherever hogs prevail,
And if you could but vaccinate
Each pig in every pen,
The world would be fine
For us and for swine—
That's the song of the serum men.

A reception and dance followed the dinner, after which the faculty of the university school of music gave a high class program, consisting of tenor solos, piano solos and pipe organ selections. Miss Maurine Gibson also contributed several vocal selections. A representative of the U. S. Public Health Service delivered a lecture on venereal diseases, and the film "Fit to Win," originally produced for exhibition to soldiers in the army, was presented in this connection.

On Tuesday forenoon, July 8th, Dr. W. G. Keehn, of Chicago, opened the session with a paper on preventive medicine.

Dr. N. S. Mayo was listened to with much attention as he related in his smooth, inimitable way a number of interesting veterinary experiences that he had while in Cuba.

Dr. W. W. Dimock, of Lexington, Ky., formerly of Ames, Iowa, gave an exhaustive paper on animal parasites, illustrating his subject with photographs that he passed around among the audience.

Dr. A. T. Peters, State Veterinarian, told of the importance of uniform methods in testing for interstate shipments.

Dr. H. W. Burkland, of Atlanta, Ga., read a paper on the clinical aspects and treatment of fatal diseases occurring in horses and mules at the Atlanta stock yards.

Dr. H. Preston Hoskins, of Detroit, Mich., presented an able treatment of the subject of hemorrhagic septicemia in cattle.

Dean Davenport discussed the university's part in veterinary education and emphasized their desire to establish in the near future a veterinary college that would be a credit to the state and to the veterinary profession.

Dr. E. T. Baker, of Moscow, Idaho, spoke on sheep practice, his talk being substantially the

same as that given before the Missouri Valley association, which appears in this issue.

The ladies, aside from their share in the regular program, were entertained by Miss Jessie Beadles and by Miss Mamie Bunch, of the university, who lectured on extension service in home economics, and also by visits to the Woman's Building, the Natural History Museum, Lincoln Hall Museum, Chemistry Department and to the Chanute Flying Field.

Three hundred and twenty-one members and visitors were registered at the door, but the attendance was somewhat in excess of this number, as some failed to register; 257 tickets were sold for the banquet, and 30 applicants for membership were favorably acted upon. In point of attendance, this meeting establishes a record for state associations, and in attendance at the banquet, probably a record for all veterinary associations. In the amount and quality of the program rendered in the two days' session, it is unlikely that it has been equaled by previous sessions of this or by any other association.

D. M. CAMPBELL, Secretary.

ASCARID INFESTATION IN SWINE*

I wish to discuss for a few minutes the subject of ascarid infestation in swine; in other words, to say something about the common round worm that occurs so frequently in the intestinal tract. You will all admit that we have looked upon it as a usually harmless creature, except when it occurred in large numbers in the intestinal tract so that it closed up the lumen and invaded the bile ducts, and only in such cases did we look upon it as a cause of serious trouble. I believe, however, that you will have to agree with me after you have observed the demonstration to be made this afternoon that the real serious part of ascarid infestation is not with the intestinal form but with the lung form.

For our information on the life cycle of ascarids, and the part they play in causing pneumonia we owe much to Captain (now Major) Stewart of the British Army and Doctor B. H. Ransom and the late Mr. W. D. Foster of the Bureau of Animal Industry. It was formerly supposed that after the eggs of the parasite that are present in the feces of infested hogs are swallowed they hatch out in the alimentary tract and the young worms then simply grow to maturity in the intestine. As a matter of fact it has been determined that the newly hatched worms do not immediately settle down in the intestine, but promptly migrate out of it, get into the circulation, and go to the liver, then to the lungs, pass up the trachea, down the esophagus and finally reach the intestine again, after which they continue their development to maturity. An important point with reference to the life history is that the eggs when first passed in the feces of an infested hog are not yet developed to the infective stage. You might give a hog half a bushel of fresh ascarid eggs that have been expelled in the feces and they would not cause infestation, because these eggs like the eggs of some other parasites must be incubated outside of the animal body. Confirming the work of others I have conducted experiments in which I have subjected ascarid eggs to a temperature of 37.5° C. and while it is true I got early cleavage up to perhaps the 16th or 32nd cell division, the cleavage then stopped. There was no further cell division, the cells became disintegrated and the eggs did not reach an infective stage. Such experiments have conclusively proved that it is impossible for ascarid eggs to incubate at the temperature of the animal body. When I speak of the infective stage, I mean when cleavage has taken place and there is an active vermiform embryo inside the egg shell. At what temperature will the egg develop best? It will develop to the infective stage in about three weeks at a temperature of 22° to 25° C. (about 71° F. to 77° F.) and in about two weeks at a temperature of 32° or 33° C. (about 90° F.). After reaching the infective stage the egg remains at that stage until swallowed by the host. Ascarid eggs are highly resistant and have been kept alive as long as five years.

How are the eggs taken up by the host? You can readily see that the soil in places occupied by infested pigs will become heavily loaded with ascarid eggs, especially such a place as a dirty hog lot, where there is plenty of loose manure, a hog wallow, etc. Probably the old sow will lie in the manure and get her skin soiled with material containing the eggs so that the suckling pig swallows ascarid eggs as well as milk, or probably the little pigs themselves will root around in the manure or drink the water from the wallow and the eggs are thus taken into the alimentary tract. The eggs do not hatch in the stomach. I have found them still intact in the stomach after 48 hours. They pass out of the stomach into the intestine and there the embryo works its way through the egg shell and the invasion takes place. At the end of four or five days, they are found in the liver, in the spleen and in the lungs in large numbers, that is, if the infestation is considerable. The symptoms are just those exhibited by the pigs brought here for this demonstration; namely, rapid breathing and signs of pneumonia. We have conducted many experiments and we absolutely know that the young worms regularly migrate through the lungs.

On posting these pigs, if there is a considerable infestation, you will always find an edematous lung. There is a pneumonia, termed embolic pneumonia, apparently resulting from the presence of the free larvae in the blood stream, and if there is a considerable infestation, there is an infiltration into the tissue. There are hemorrhages distributed throughout both lungs. If we open up the trachea or one of the bronchi, scrape a little mucus out and put it under the miscroscope, we find a large number of free larvae on the slide.

*Address, Illinois Veterinary Medical Association meeting, Champaign, Ill., July 7, 1919.

As to the route by which these larvae get from the lungs into the alimentary tract, we have traced them from the smaller bronchioles and into the esophagus and into the intestinal tract. They reach the alimentary tract in this way. I also want to impress this fact on your minds, that as a rule large numbers of the larvae that reach the alimentary tract will make their way out with the feces, and only a portion of them will succeed in establishing themselves and will grow to maturity in the intestine. It is even possible in some cases that although large numbers of larvae pass through the lungs none of them will remain in the intestine so that the lung stage is not always followed by a persistent intestinal stage.

I have had this experience. I went to a certain farm in Illinois where a man had 150 pigs of different ages. There are 30 of these I want to call your attention to. I told the owner they would pass through the lung stage because the hog pens were dirty and filthy and some of the older pigs had gone through that stage. He said the hogs were looking fine. I told him they wouldn't be that way after a week or two. I went into the pasture where they were and picked up composite samples of feces, took them back to the laboratory and after decanting the feces, on examination under the microscope, found in every field from two to eight larvae, showing that these larvae pass out in large numbers through the alimentary tract.

I have given you the cycle. The one thing I want to emphasize here is the lung stage. The mortality from infestation with the lung stage is greatest, especially in suckling pigs, at an age of two to six weeks. Not only may there be death losses, but there is a vast amount of shrinkage and pigs are backward in growth as a result of this ascarid infestation. I want to give you just one illustration of this fact. When Dr. Ransom assigned me to this work, I thought it was a big job and I felt I needed help. So I asked the help of the hog cholera division at Washington, and Dr. McDonald of Springfield, in charge of hog cholera control in this state, gladly consented to assist. But the question asked was, How can we search for something if we do not know its identity? I went to Bloomington and through the kindness of Mr. Jones and Dr. Blackman, obtained a sow with seven little pigs. Five out of the seven were fed with ascarid eggs and two kept as controls. At the end of six days, one died. We posted it and found what we expected to find. That night another one died and the next day we sacrificed one and found the same condition. Then we decided if the two would live, not to kill them. We cleaned up the pen and the four, the two affected and the two controls, were put together. One of the former died. I visited Mr. Jones's farm last week. It was 50 days after the infection and we weighed the pigs. The two controls weighed 65 pounds, and the infected pig weighed 33 pounds.

It seems to me that this must be the clinical picture many a veterinarian has in the field when pigs have passed through the stage of coughing and thumps, when bacterins will do no good and when hog cholera serum will do no good. Possibly ascarid infestation may be an answer to that question. I want to say this guardedly. I do not want you to go out and say that I said that every case of thumps and every case of so-called "mixed infection" is a case of ascarid infestation, but perhaps it exacts its toll. We do not claim that all diseases of suckling pigs are due to ascarid infestation, but we do claim that the lung stage of this infestation may be a serious matter.

Older pigs becoming infested get over the infestation and stand a better chance to survive, but young pigs do not stand up under it, and even if they do not die we must not overlook the enormous loss due to shrinkage and backwardness in growth.

The only solution is sanitation. Get clean farrowing pens. Plow up the hog lots and prevent infestation, for so far as concerns treatment for the lung stage, there is nothing known that will overcome the condition. Sanitation accordingly is the answer to this question as well as to a number of others.

Chicago, Ill. H. B. RAFFENSPERGER.

COMMENT:

Dr. H. W. Bayler, an associate of Dr. Raffensperger in the investigation of ascarid infestation of swine, supplied the association with a most instructive clinic, comprising five pigs that had been inoculated with ascarids six to seven days previous to the meeting. Two pigs not infected were used as controls. The inoculation consisted of the administration by the mouth of a suspension of ascarid eggs. These pigs were shown to the veterinarians at the meeting previous to the address of Dr. Raffensperger, and a very large majority diagnosed the cases as mixed infection. Others named the condition "thumps," and still others thought the cases might be early stages of necrotic enteritis. The pigs were furnished by Dr. Blackman and Mr. Funk, of the Mid-Western Laboratories, to whom thanks are due. Two pigs that seemed to be worst affected were slaughtered and mucus squeezed from the bronchioles was shown by microscopic examination to be teeming with Ascaris embryos. No lesions other than those in the lungs were found on autopsy, and the cases were unanimously admitted to be simply Ascaris infestation of the lungs. No claim was made that all cases that have heretofore been diagnosed as mixed infection are in reality pulmonary Ascaris infestation, but it was shown that such conditions may be due to Ascaris infestation, and the investigation of Drs. Raffensperger and Bayler show that such infestation is widespread in Illinois and causes large losses in pigs, losses due not only to death of pigs, but to stunting of those that survive. D. M. C.